Norton Sound Summer Commercial Red King Crab Fishery Observer Project Summary Report, 1989

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INTRODUCTION

The Norton Sound Section of the Eastern Bering Sea consists of all waters in statistsical area Q that are north of the latitude of Cape Romanzof, east of 168 west longitude, and south of the latitude of Cape Prince of Wales (Figures 1 and 2). A large vessel summer commercial fishery has existed in this section since 1977.

The 1989 summer commercial fishery for red king crab (Paralithodes camtschatica) in the Norton Sound Section of the Eastern Bering Sea, began at 12 noon on August 1 and ended at 12 noon on August 4.

Ten vessels participated in the 1989 summer commercial season, seven catcher/processor vessels and three catcher vessels. Prior to the start of this fishery one Alaska Department of Fish and Game (ADF&G) observer was placed aboard a catcher vessel. This is the ninth year ADF&G has placed departmental observers aboard vessels. In addition a new regulation (5AAC 39.645) adopted by the Board of Fisheries mandated all catcher/processors and floating processors which process king crab to have independent observers onboard. These observers work for independent contractors and are certified by ADF&G. This is the first year subcontracted observers have been placed aboard commercial vessels in the Norton Sound area. One such observer was placed aboard each catcher/processor vessel prior to the start of the commercial fishery. The purpose of the placement of observers on fishing vessels is to 1) assist the managers in determining the magnitude and location of the commercial harvest 2) to collect various biological data which will aid in determining the status of the stock and 3) to determine whether regulations are complied with.

Onboard observers provide the only effective means of collecting essential biological and management data from vessels that process shellfish, and this data is necessary to achieve a sustainable yield of the king crab resource. It is also in the case of processing vessels, the only effective means to enforce regulations that protect this resource. Catcher vessels are not required to have an observer, but may choose to allow a Departmental observer onboard to collect data for the fishery.

Objectives and Tasks

The specific objectives and associated tasks of the observer program are to:

1. Report the catch statistics daily (number of pots pulled and number of legal crab harvested) for each statistical area fished by the fishing vessel on which the observer is placed and the catch statistics of any vessels delivering to the observer's vessel.

2. Obtain samples of length frequency of harvested legal male and incidentally caught sublegal and female king crab. Legal crab being male red king crab whose carapace width equals or exceeds 4 3/4 inches.

3. Determine mean live weight of the harvested legal male crab.

4. Determine the carapace age of the sampled crab.

5. Determine the percentage of new recruits in the commercial harvest.

6. Determine the degree of ovigerity for incidentally caught females.

7. Develop a relative abundance index of legal males, sublegal males and females by systematically recording the catch of as many pot lifts as feasible.

METHODS

The methods for catch reporting, sampling crab, conducting skipper interviews, and collecting information from tagged crab are presented in several operational plans and manuals (ADF&G 1986, 1989a, 1989b). These publications are available through the ADF&G commercial fishery office in Nome. The identity of vessels from which observer data was obtained have been omitted from this report to maintain confidentiality.

All females without eggs which had a length of 75mm or larger were considered to be barren adults. All females without eggs which were less than 75mm were considered to be juveniles. This was based on information presented by Brannian (1985).

The quality and quantity of the various types of data collected varied considerably from observer to observer. Some types of data were not collected at all by some observers for various reasons. In certain instances obvious mistakes were made by observers such as collecting carapace width instead of length and in identifying new and old shell crab. Where such data were obviously incorrect they were deleted from the data base. One catcher vessel delivered its catch to Dutch Harbor, since no observer was onboard its catch was not included in this report.

RESULTS

Harvest Summary

Catch reporting logs were kept by observers on 80% of the vessels for each statistical area fished and were reported on a daily basis to the Fish and Game office in Nome. Vessels fished in 5 statistical areas (Table 1). Most pot pulls occurred in statistical area 666401 (50.9%), followed by area 656401 (34.2%). Area 656401 however had the highest percent harvest (46.1%), followed closely by area 666401 (44.2%). Only 8.8% of the harvest came from area 636401 though nearly 14% of all pot pulls occurred in this area (Figure 2). The remaining two areas 656330 and 666330, which are farther from shore, combined contributed 1.0% of the harvest and made up only 1.2% of the pots pulled. Reported pot pulls from observer vessels totaled 4,868 with a total harvest of 76,138 crab and a catch per pot (CPP) of 15.6 crab.

Log summary sheets of observed potlifts were kept by five out of eight observers. A summary log sheet by statistical area is presented in Table 2. Overall observed mean soak per pot was 24 hours. Based on both daily harvest reports and data collected by observers the CPP of legal males was highest in area 656401

(15.1-21.1), followed by 666401 (11.8-13.6) and 656330 (12.8-13.4), 666330 (11.5-12.1), and 636401 (6.9-10.0). Catch per pot standardized over a 24 hour period (CPP/24hr) differed somewhat. Area 656401 was highest (14.9), followed by area 656330 (13.6), 666330 (12.2), 666401 (11.7) and 636401 (8.0). The observed overall mean CPP and observed overall mean CPP for each statistical area (Table 2) are consistantly slightly lower than those from the total harvest summary (Table 1). The directly observed pot lifts by observers are only a subsampling of the actual catch and may be biased. The overall averages compare closely although some means for statistical areas disagree by more than 50%.

The observed catch rate of sublegal males was also highest in area 656401 (3.4 cpp/24hr) as was female catch (4.3 cpp/24). Legal males made up over 90% of the observed catch in areas 656330 and 666330, which are farther off shore. This is as expected as adult males are larger and tend to migrate offshore farther and faster than sublegals and females once molting and mating have been completed. Legal male crab accounted for approximately 67% of the overall observed catch.

Six observers provided utilizable information on illegal harvest levels from 7 vessels. They sampled a total of 9,966 harvested crab. Of these 29 or 0.3% were illegal crab. Only one illegal crab was female. Of 15 vessel days sampled, illegal catch by individual vessels ranged from 0.0% to 2.9% of the harvest, all less than the 3.0% limit thought to be citable by Fish and Wildlife protection. The low illegal harvest levels for all sampled vessels are probably at least in part due to the onboard observer program.

Legal Male King Crab

Carapace length, carapace age and crab weight data were collected by observers from the catch of each vessel. Samples were also collected from one additional vessel which delivered to one of the catcher/processors. Data from two of the vessels was unusable. Neither observer appeared to have properly measured crab length, and one of the two simply listed all crab measured as old shell. Data collected by these two observers are excluded from this report.

Carapace length measurements were collected from 2,595 legal male red king crab during the 1989 fishery (Table 3, Figure 3). Carapace age was also determined for each crab sampled. Carapace age was subjectively classified as new (11 months old) or old (at least 23 months old). King crab which possessed a new shell carapace accounted for 71% of the total legal male crab sampled, and old shell crab 29%.

During the winter of this same year 296 legal males were sampled in the offshore Nome area of Norton Sound by an experienced biologist. At this time red king crab congregate in the near shore waters and samples are likely to be more representative of the population than in the summer when some segregation by size occurs in the outward migrating population. New shell/old shell were also found to be 71% and 29%, respectively, suggesting that overall new shell/old shell classifications in the summer commercial season were probably both accurate and representative of the legal male population. Mean carapace length measurements from the summer season were similar for all areas sampled; 119.8,

119.4, and 120.5mm for areas 636401, 656401 and 666401 respectively (Tables 4, 5, & 6). Overall mean length of sampled legal males was 119.8mm. Mean length of the winter sample was 114.3mm-noticably smaller. Mean length observed in the 1987 and 1988 summer commercial seasons were 121.7mm and 119.0mm respectively. No winter study was conducted in 1988 but the 1987 mean legal crab lengths (111.8mm) were also smaller than those collected during the summer season.

Recruit red king crab are defined as legal crabs less than or equal to 115mm in carapace length and possessing a new shell condition carapace. In the various samples taken throughout the duration of fishery, recruit king crab ranged from 4% to 50% (Table 7). Recruit crab accounted for an average only 23% of the total legal male king crab sampled (Table 7). Postrecruit king crab dominated the legal male crab sampled comprising 77%. Postrecruits dominated the summer commercial fisheries in the past as well with recruit levels of only 22% in 1987, and 25% in 1988. The previous 5 year average (1982-1986) was 47% recruit crab. The continued low recruitment suggests the population remains stabilized at its current low level. Prerecruits, recruits, and post recruits made up 18%, 19%, and 63% respectively of this years observed male catch (Table 8, Figure 4).

Mean weight of legal crab was determined from a sample of 459 individuals. Mean weight of samples ranged from 2.8 to 3.6 pounds per crab. Overall mean weight for the entire legal male sample was 3.12 pounds (Table 9). This compares with mean weights of 3.15 pounds in 1988 and 3.20 pounds in 1987. Mean weight samples were obtained from areas 636401, 656401 and 666401 with corresponding mean weights of 3.4, 3.0 and 3.2 respectively.

Overall observed mean catch per pot (CPP) of legal male king crab was 13.7 crab/pot. Overall observed mean catch per pot, standardized for a 24 hour soak period (CPP/24hr), was also 13.7 crab/pot (Table 2). Observed mean CPP/24hr was 8.0 in area 636401, to 11.7 in 666401, 12.2 in 666330, 13.6 in 656330, and 14.9 in 656401. During most years the highest catch rates center near 165° W long, as they did in 1989. The occurance of high catch rates and the assumed density distribution of crab is consistent with the seasonal migration documented by past tagging studies.

Observed mean string CPP/24hr ranged from 3.5-17.7 in area 636401, 4.6-54.6 in area 656401, 3.9-28.1 in area 666401, 12.6-14.4 (2 strings) in area 656330 and 11.5-13.3 (2 strings) in area 666330.

Sublegal (Prerecruit) Male King Crab

Carapace length measurement and shell age were collected from 1,009 of the 2,804 observed sublegal male king crab (Tables 10 and 2, Figure 5). New shell crab accounted for 75% of the sample. Overall mean length of the sublegal crab sample was 88.4mm. In contrast this years winter sample of 216 sublegal males, examined by an experienced biologist, were found to have all been new crab, except for 1 individual. It is likely that the inexperience of the observers contributed to the number of sub legal crab judged to be old shells. Mean length from the winter sample was 87.3mm, which is only slightly smaller than observed in the summer commercial fishery. New shell crab accounted for 82% of the sampled summer population in 1988 and 89% in 1987, while mean lengths for each year were

96.7mm and 89.8mm, respectively.

Data was obtained this year from five statistical areas. Areas 636401, 656401, 666401,656330 and 666330 had 85%, 72%, 74%, 66%, and 73% new shell crab respectively. Overall mean length for each respective area was 87.4, 88.8, 87.7, 88.6, and 89.2 (Tables 11, 12, 13, 14 and 15).

Overall mean catch of sublegal male king crab per pot, standardized to a 24 hour soak period (CPP/24hr) was 3.1 crab/pot (Table 2).

Overall mean CPP/24hr was highest in statistical area 656401 (3.4), followed by area 666401 (2.9), 636401 (2.4), 656330 (1.1) and 666330 (0.6). The range of string mean CPP/24hr for each area was 0.0-17.0 (59 strings), 0.1-27.9 (27 strings), 1.4-4.6 (3 strings), 1.0-1.2 (2 strings) and 0.3-0.9 (2 strings) respectively.

Relatively high sublegal king crab catches, equal to or greater than 10 CPP/24hr, occurred only in areas 656401 and 666401. One vessel observer recorded exact string positions for observed strings within these statistical areas. The observer recording string positions documented high sublegal catches within the NW corner of area 656401 between 64° 7'and 64° 12' N. latitude, 165° 42' and 165° 53' W. longitude. Similarly, in 1988 high sublegal catches within area 656401 occurred at 64° 11'-14' N. latitude (165° 52'-166° 01' W. longitude) and in 1987 were concentrated north of 64° 07' N. latitude and west of 165° 30' W. longitude. The only recorded string observed in area 666401 was in the southern quarter which had a low CPP/24hr of 0.7 sublegals.

Female King Crab

During the commercial fishery, 350 of the observed 2,925 female king crab were sampled for maturity and carapace length. Ten percent of the total female sample was immature (Table 16, Figure 6). This compares with 20% occurrence of immature female crab during the previous two years. Mean carapace length of immature female king crab was 68.1mm, similar to the past 2 years (67.6mm and 68.8mm).

Most of the mature female king crab, 78%, were considered to have a high degree of ovigerity ($\geq$ 60%). This is a decline however over the previous 2 years, 89% in 1988 and 92% in 1987. Mean carapace length of the adult female sample was 80.1mm (Table 16) and was similar to, though slightly smaller than, the previous 2 years (82.5mm and 81.0mm).

Females were sampled from four different statistical areas 636401, 656401, 666401, and 656330 (Tables 17, 18, 19 and 20). Corresponding sample sizes from each area were 63, 178, 107 and 2. Corresponding percentages of immatures were 32%, 7%, 2% and 0%. Corresponding mean immature carapace lengths were 66.9mm, 70.0mm, and 68.5mm. No immature female crab occurrenced in area 656330. Mean adult lengths were 79.9mm in area 636401, 809 mm in area 656401, 78.8mm in area 666401, and 89.5mm in area 656330. Mature females having a high degree of ovigerity ($\geq$60%) made up 91%, 85%, 63% and 100% of the corresponding sampled mature females in each area.

Overall observed mean catch per pot of female king crab standardized to a 24 hour

soak period (CPP/24hr), was 3.1 crab. Mean CPP/24hr, and mean range of CPP/24hr. in strings for statistical areas 636401, 656401, 666401 and 656330 were 0.8 (0.3-1.3), 4.3 (0.0-101.9), 1.4 (0-21.2), and 0.1 (0.1-0.1). No females were observed in pot lifts from area 666330. Relatively high catches of female king crab ($\geq$0.2 CPP/24hr) occurred in areas 636401, 656401 and 666401 which are near shore as opposed to low values for areas 656330 and 666330 which are farther out.

Precise string locations corresponding to observed catch were only available from one observer vessel. This vessel fished predominantly in 656401 with only a single string being fished in each of the areas 666401, 656330, and 666330. The single string in 666401 occurred in its extreme far shore SE corner, the one in 666330 in its extreme NE most corner bordering 666401, and the one in 656330 occurred in its far NW corner. All three had low catches of females. This same vessel observed relatively high catches of females from 64° 16' N. latitude north to the 64° 15' N. latitude closure line between 165° 33' and 165° 52' N. longitude. The eastern boundary was simply the most eastward extent this vessel fished, where as to the west low catches of female crab were observed even to within a few degrees south of the closure line. Presumably, since relatively high catches occurred to the west in area 666401, these high catches probably occurred in proximity to the northern closure line. Relatively high catches of female crab occurring in area 636401 well to the east suggest continued abundance of females east of areas fished in area 656401 by this vessel.

During the 1989 summer commercial season, 1,359 (46%) of the 2,925 females observed by the 8 observer vessels came from one string of one vessel and 1,100 (38%) from one string of another vessel, both in area 656401. Together they accounted for 84% of the entire observed female catch. The exact location of the string comprising 46% of the catch was recorded and was largely a paralleled line bordering the closure line at 64° 14' 52" N. latitude (with a tail extending to 64° 13' 79") between 165° 38' and 165° 46' N. longitude. It is likely that the other string comprising 38% of the catch was also within a couple minutes latitude of this boundary. This data suggests that the near shore closure line of 65° 15' 00" N. latitude has a biological significance. This boundary not only protects the near shore subsistence fishery, it acts as a buffer preventing heavy incidental catch of the female population in the nearshore areas. It is interesting to note also that these 2 strings while having female CPP/24 hr of 101.9 and 35.4 respectively also had low corresponding sublegal CPP's/24hr of only 1.0 and 2.2. Relatively high catches of sublegals ($\geq$ 10 CPP/24 hr) were not noted until a few minutes south of the closure line at 64° 12' N. latitude.

During the 1988 summer season relatively high catches of females ($\geq$ 0.2 CPP/24hr) were noted to occur sporadically from 64° 6" N. latitude to the closure line at 65° 15' N. latidude between 165° 39' and 166° 9'N. longitude; the highest incidence noted (as high as 83 per pot) occurred at 64° 14' N. latitude between 165° 39' and 165° 53' N. longitude. Greater than 10 females per pot were only noted north of 64° 11' 50". No areas to the east of 165° 39' longitude were fished during the 1988 summer season. In the 1987 summer season high catches of females were prevalent in the most northern quarter of area 656401 proximal to the 64° 15' 00" N. latitude closure line. Catches however were highest east of 165° 30' 00" N. longitude, an area for which information was unavailable in the 1988 and 1989 seasons.

Bycatch

Bycatch information was largely sporadic, where collected at all. Quantifiable information includes 9 codfish in 74 pot lifts (0.1 CPP); 32 opilio crab in 80 pots (0.4 CPP); 19 flounder in 44 pots (0.4 CPP); 1 rockfish in 21 pots; 1 sculpin in 21 pots; 1 eelpout in 21 pots; 55 flatfish in 57 pots (1.0 CPP); 3 to 4 seastar per pot in a string or 26; and 1 possible female decorator crab in a string of 23 pots. One observer who appeared to make good detailed notes (but much of whose other data was unusable) documented for 24 pots, 294 lyre crab (12.3 CPP), 206 opilio (8.6 CPP), 38 yellowfin sole (1.6 CPP), 3 starry flounder (0.1 CPP), 3 eelpout (0.1 CPP) 1 Korean hair crab (0.04 CPP) and 1 pacific halibut (0.04 CPP). Three blue crab females with eggs and 3 1/2 - 4 inch carapace widths were noted by another observer. Data is questionable as observer notes were sometimes unclear and open to different interpretations. Observers may also have been prompted to start bycatch observations by unusual sightings which may have biased observations. Individuals tended to note certain types of bycatch and ignore others in their notations. Overall, starfish and flatfish were common; common flatfish were yellow fin sole and starry flounder. Small Opilio crab occured frequently. Eelpout, rockfish, cod and sculpin were occasional bycatch.

DISCUSSION

During the 1989 red king crab fishery in the Norton Sound section, 10 vessels participated in the fishery. Seven were catcher/processors participating in the new observer program and three were catcher vessels, one of which voluntarily accepted a departmental observer. All but one observer vessel concentrated in statistical areas 666401 and 656401. One observer vessel fished exclusively in area 636401, and two laid an experimental string each, in each of areas 656330 and 666330. One non-observer vessel which delivered to an observer vessel fished exclusively in area 656401 and the other non-observer vessel fished exclusively in 646330 and delivered to Dutch Harbor. The departmental observer noted legal males to occur throughout the four areas fished (656401, 666401, 656330 and 666330). This vessel chose the strategy of conducting a short initial period of prospecting followed by homing in on the larger concentrations with occasional additional prospecting. Attempts were made to avoid laying strings close to those of other vessels. Upon the opening of the season most vessels seemed to congregate in the same area (656401), then spread out to avoid over lapping each others strings. The large number of vessels in conjunction with the anticipated short fishery, which lasted only three days, may have prompted 2 of the vessels to move to more distant areas that are traditionally of a less productive nature. Area 666401 was the most heavily fished, followed by area 656401. Area 656401 however was the most productive. As was the case last year the catch of legal king crab increased on the last day of fishing as vessels focused on the most lucrative areas and increased their effort.

Post recruit crab dominated the 1989 harvest and recruitment to the harvestable stock was relatively low. Low recruitment occurred the previous 2 years as well. Despite a substantial reduction in the harvest goal to 200,000 pounds (roughly a 10% exploitation level) for the 1988 and 1989 seasons the fishery is still largely dependent on post recruit crab. Maintaining the current level of harvest at 10% with a recruitment level of 22% should allow for a slow gradual increase

in the harvestable population.

The observed prerecruit crab population tended to be more restricted in distribution than that of the legal population and was largely concentrated in the northern half of area 656401 (western two-thirds) between 65° 7' and 65° 12'N. latitude. Population concentrations probably continue westward along this latitude.

The female crab population also tends to be more restricted, occuring in relatively high concentrations ($\geq$ 0.2 CPP/24hr) only north of 65° 06'N. latitude and east of 165° 52' N. longitutde. Extremely high concentrations (102 per pot/24hr) were found right along the border of the closure line at 65° 15' 00" N. latitude. This implies a biological significence to this closure line in that it serves to prevent a heavy incidental catch of female crab, which could result in descreased recruitment.

COMMENTS ON OBSERVER PROGRAM

This was the first year that the manditory observer program for catcher processors was in effect in Norton Sound. The observers had all been certified one year earlier and several had gotten lax or had forgotten their training. Additionally several experienced observers were confused by the different data collection requirements in Norton Sound. The following are some comments and suggestions to avoid problems in the future:

I. A one day intensive retraining/refreshing of all observers is needed prior to the summer commercial fishery. It should provide detailed step by step instructions on data collection and entering data on forms. Training should emphasize those areas that seemed to be a problem in the 1989 season. Problem areas that should be addressed are listed below.

A. Data collection

1. Measure carapace width for legality and measure carapace length for biological purposes. One observer didn't distinguish between the two measurements and what another observer measured for biological purposes is uncertain. Checking out each observer for ability to properly take both measurements would be well worthwile.

2. Hands on training of observers to age crab carapaces prior to the summer commercial season would greatly increase the accuracy of new and old shell determinations. Perhaps carapaces of known age from the winter harvest could be saved and used for this purpose. Supplying color photos of new and old shell crab from the Norton Sound area in each observers book would provide an objective reference in the field. Photographs from the prior summer season would be ideal as shell age characteristics would be the same. Classification of shells as new or old varied considerably from observer to observer and it is unclear how much of this was due to differences in subsamples of the population examined and how much was due to differences in the observers interpretation of shell age. One observer simply classed all crab as old shell.

3. If bycatch information is to be obtained the most important and common bycatch species of Norton Sound should be reviewed with observers. Data from observers indicated a limited ability to identify bycatch from pots.

B. Data logging

1. C/P Daily Summaries. It needs to be emphasized that items 1 to 4 on the form refer to information recorded on the 'Department of Fish & Game legal crab tally sheet' and not to any purely biological information gathered in season. Item 1 should refer to the total number of crab harvested that observers checked for legality on their tally sheet. It should be the sum of both legal and illegal crab recorded on the tally sheet. If harvested crab were sampled for length frequency and also checked for legality, legality should be recorded on the tally sheet as well to avoid confusion. Most observers included the numbers of legal male, sublegal male, and female crab measured for biological purposes in these columns, mixing them in with the numbers seen in their legality checks from their tally sheets. Most observers did not include non-legal crab as part of their total in item 1. One observer came up with numbers that bore no relation to his legal tally sheet or biological sampling or any combination thereof. Only 2 of the 7 catcher/processor observers completed the daily summary form correctly.
2. Field form 1. Emphasis needs to be placed on collecting length frequencies for sublegal males and females. One observer didn't. Also that measurements are of biological lengths. Two observers recorded something other than this. It is also necessary to carefully explain how to calculate % recruits; 5 observers could not do this.
3. Field Form 2. Emphasis needs to be placed on collection of pot information along with a detailed explanation of what is required to properly fill out the form. One observer failed to collect any information and another had no idea what information was to be collected.
4. Catch reporting log. Emphasis needs to be placed on catch data for this form. One observer either didn't use it or didn't turn it in at the end of the season.
5. Department of Fish and Game Legal Crab Tally Sheet. More emphasis needs to be placed on a minimum of 600 harvested crab per day required to be checked on normal pot pull days. One observer forgot about the minumum sample size.

C. Changes in data forms.

1. Field form 1. This form should be modified so that the legal male length frequency of new shell crab is boxed in from the top of the column down to and including carapace length 115mm. The definition of recruit should be footnoted on this form. Only 2 of the 7 catcher processor observers knew how to indentify and report the percentage of recruit crab observed.
2. Field form 2.
   a. The last column should be relabeled lat./long. to encourage

identification of the string location they are observing. No catcher/processor observer obtained this information which is invaluable for determining the specific distribution of the various segments of the population.

b. Column 3, # pots, should be changed back to buoy. Less confusion and more accurate recordings will be obtained if data is recorded for each pot that is pulled rather than for entire strings.

3. Department of Fish & Game Legal Crab Tally Sheet.
This form is confusing and should be modified so the different segments are more clearly separated. Items 1-4 should be headlined (and underlined) "from the Legal Crab Tally Sheet" and indented. The phrase "From the vessel masters estimate" should capitalized, "o.k." underlined, and items 5-7 indented. Similar treatment should be given for the remaining 2 headings and corresponding items. Items 8-12 could be omitted entirely; they were ignored or misinterpreted by all except 1 observer, and don't provide useful data.

4. Bycatch form
A separate bycatch form should be developed so that bycatch information can be recorded systematically instead of appearing as vague scribblings on Field Form 2. Field form 2 has no room for detailed recordings. A separate form would both encourage the collection of this information and would make what information was collected more reliable and interpretable. A form developed specifically for Norton Sound, with column headings listing the more common bycatch, would be useful.

2. Stricter standards are needed for observer certification. The current program is certifying individuals who often failed to correctly measure king crab, classify new and old shell (even allowing for its high degree of subjectivity), identify recruits, identify common bycatch, complete data forms correctly and follow simple instructions. Only one non-departmental observer provided reasonably high quality information. Two others provided most of the information required in a usable form. The remaining four made major mistakes in data collection or simply did not collect much of the data that was required.

3. Require at least 1 string/day be observed in its entirety for legal, sublegal, and female crab (with latitude and longitude recorded). This can be done without unduly hampering the crew.

LITERATURE CITED

Brannian, L.K.. 1987. Population Assessment for Red King crab (Paralithodes Camtschatica) in Norton Sound, Alaska, 1985. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Data Report 214, Juneau, Alaska.

Table 1. Red king crab harvest summary for observer fishing vessels, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989. a

	636401		656401		666401		656330		666330	
Date	pots	crab	pots	crab	pots	crab	pots	crab	pots	crab
8/1-8/2	87	327	171	3431	182	1609	-	-	-	-
8/2-8/3	221	2517	853	18176	629	8031	34	455	23	279
8/3-8/4	280	2771	612	12755	1371	22799	-	-	-	-
8/4	80	1060	29	734	296	1194	-	-	-	-
Total	668	6675	1665	35093	2478	33633	34	455	23	279
Catch per pot		10.0		21.1		13.6		13.4		12.1
Percent of harvest		8.8%		46.1%		44.2%		0.6%		0.4%
Total Pots		4868								
Total Harvest		76138								
CPP		15.6								

a Data used from the 8 observer reports rather than boat fish tickets.

Table 2. Observer crab catch summary; number of observed pot lifts, average soak time, legal males, sublegal males, and females and proportion (%) of each captured by statistical area, and the corresponding mean number of crab caught per observed pot lift (CPP) and pot lift standardized to a 24 hour soak period (CPP/24hr), Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Stat. Area	#Pot Lifts	Ave. Soak Time	Legal Males				Sublegal males				Females			
			number	%	CPP	CPP /24h	number	%	CPP	CPP /24h	number	%	CPP	CPP /24
636401	57	20.7	391	71.2%	6.9	8.0	118	21.5%	2.1	2.4	40	7.3%	0.7	0.8
656401	605	24.3	9106	66.0%	15.1	14.9	2075	15.0%	3.4	3.4	2607	18.9%	4.3	4.3
666401	196	24.3	2315	73.3%	11.8	11.7	569	18.0%	2.9	2.9	276	8.7%	1.4	1.4
656330	30	22.7	385	92.1%	12.8	13.6	31	7.4%	1.0	1.1	2	0.5%	0.1	0.1
666330	21	22.6	241	95.6%	11.5	12.2	11	4.4%	0.5	0.6	0	0.0%	0.0	0.0
TOTAL	909	24.0	12438		13.7	13.7	2804		3.1	3.1	2925		3.2	3.2
Percent of obs. catch				68.5%				15.4%				16.1%		
Total crab obs.			18167											

Table 3. Carapace length measurement summary of sampled legal male red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
98	1	0.05	0.1%		0.00	0.0%	1	0.04	0.0%
99	1	0.05	0.1%	1	0.13	0.1%	2	0.08	0.1%
100	2	0.11	0.1%		0.00	0.0%	2	0.08	0.1%
101	4	0.22	0.2%	1	0.13	0.1%	5	0.19	0.2%
102	10	0.55	0.5%	4	0.54	0.5%	14	0.55	0.5%
103	15	0.84	0.8%	5	0.69	0.7%	20	0.79	0.8%
104	29	1.64	1.6%	8	1.11	1.1%	37	1.48	1.4%
105	31	1.77	1.7%	8	1.12	1.1%	39	1.58	1.5%
106	29	1.67	1.6%	11	1.55	1.5%	40	1.63	1.5%
107	43	2.61	2.4%	15	2.14	2.0%	60	2.47	2.3%
108	35	2.05	1.9%	15	2.16	2.0%	50	2.08	1.9%
109	50	2.96	2.7%	19	2.76	2.5%	69	2.90	2.7%
110	48	2.86	2.6%	16	2.34	2.1%	64	2.71	2.5%
111	46	2.77	2.5%	12	1.77	1.6%	58	2.48	2.2%
112	58	3.52	3.1%	23	3.43	3.1%	81	3.50	3.1%
113	55	3.37	3.0%	17	2.56	2.3%	72	3.14	2.8%
114	61	3.77	3.3%	31	4.71	4.1%	92	4.04	3.5%
115	76	4.86	4.2%	20	3.06	2.7%	96	4.34	3.8%
116	87	5.47	4.7%	44	6.80	5.9%	131	5.86	5.0%
117	69	5.85	4.8%	37	5.76	4.9%	126	5.68	4.9%
118	67	5.57	4.7%	25	3.93	3.3%	112	5.09	4.3%
119	84	5.42	4.6%	33	5.23	4.4%	117	5.37	4.5%
120	92	5.99	5.0%	28	4.47	3.7%	120	5.55	4.6%
121	71	4.66	3.9%	33	5.32	4.4%	104	4.85	4.0%
122	95	6.29	5.2%	34	5.52	4.5%	129	6.06	5.0%
123	82	5.47	4.4%	30	4.91	4.0%	112	5.31	4.3%
124	64	4.30	3.5%	40	6.60	5.3%	104	4.97	4.0%
125	67	4.54	3.6%	28	4.66	3.7%	95	4.58	3.7%
126	56	3.83	3.0%	24	4.03	3.2%	80	3.88	3.1%
127	46	3.17	2.5%	28	4.74	3.7%	74	3.62	2.9%
128	49	3.40	2.7%	24	4.09	3.2%	73	3.60	2.8%
129	51	3.57	2.8%	25	4.29	3.3%	76	3.78	2.9%
130	42	2.96	2.3%	16	2.77	2.1%	58	2.91	2.2%
131	22	1.56	1.2%	13	2.27	1.7%	35	1.77	1.3%
132	28	2.00	1.5%	9	1.58	1.2%	37	1.88	1.4%
133	17	1.23	0.9%	14	2.48	1.9%	31	1.59	1.2%
134	18	1.31	1.0%	9	1.61	1.2%	27	1.39	1.0%
135	13	0.95	0.7%	10	1.80	1.3%	23	1.20	0.9%
136	10	0.74	0.5%	11	1.99	1.5%	21	1.10	0.8%
137	6	0.45	0.3%	12	2.19	1.6%	18	0.95	0.7%
138	8	0.60	0.4%	8	1.47	1.1%	16	0.85	0.6%
139	10	0.73	0.5%	6	1.11	0.8%	16	0.86	0.6%
140	14	1.06	0.8%	2	0.37	0.3%	16	0.86	0.6%
141	4	0.31	0.2%		0.00	0.0%	4	0.22	0.2%
142	11	0.85	0.6%	1	0.19	0.1%	12	0.66	0.5%
143	5	0.39	0.3%		0.00	0.0%	5	0.28	0.2%
144	3	0.23	0.2%		0.00	0.0%	3	0.17	0.1%
145	3	0.24	0.2%		0.00	0.0%	3	0.17	0.1%
146	4	0.32	0.2%		0.00	0.0%	4	0.23	0.2%
147	2	0.16	0.1%		0.00	0.0%	2	0.11	0.1%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149		0.00	0.0%	1	0.20	0.1%	1	0.06	0.0%
150	3	0.24	0.2%		0.00	0.0%	3	0.17	0.1%
151		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153	1	0.08	0.1%		0.00	0.0%	1	0.06	0.0%
154		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
158		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
159		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
160		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
161	1	0.09	0.1%		0.00	0.0%	1	0.06	0.0%
162		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
163		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
164		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
165	1	0.09	0.1%		0.00	0.0%	1	0.06	0.0%
Total No.	1844		71.1%	751		28.9%	2595		100.0%
Mean		119.6			120.5			119.8	

Total legals 2595

Total Recruits 598
Percent 23.0%

Total Post Recruits 1997
Percent 77.0%

Table 4. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 636401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-4, 1989.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
98		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
99		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
100		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
101		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
102	2	1.13	1.1%		0.00	0.0%	2	0.74	0.7%
103	3	1.72	1.7%		0.00	0.0%	3	1.12	1.1%
104	5	2.89	2.8%		0.00	0.0%	5	1.88	1.8%
105	3	1.75	1.7%		0.00	0.0%	3	1.14	1.1%
106	6	3.53	3.3%		0.00	0.0%	6	2.30	2.2%
107	7	4.16	3.9%	1	1.10	1.0%	8	3.09	2.9%
108	7	4.20	3.9%	1	1.11	1.0%	8	3.12	2.9%
109	10	6.06	5.6%	2	2.25	2.1%	12	4.72	4.3%
110	3	1.83	1.7%		0.00	0.0%	3	1.19	1.1%
111	7	4.32	3.9%	1	1.14	1.0%	8	3.21	2.9%
112	11	6.84	6.1%	1	1.15	1.0%	12	4.85	4.3%
113	6	3.77	3.3%	1	1.16	1.0%	7	2.86	2.5%
114	14	8.87	7.8%	3	3.53	3.1%	17	7.00	6.1%
115	5	3.19	2.8%	1	1.19	1.0%	6	2.49	2.2%
116	4	2.58	2.2%	2	2.39	2.1%	6	2.51	2.2%
117	12	7.80	6.7%	5	6.03	5.2%	17	7.18	6.1%
118	9	5.90	5.0%	1	1.22	1.0%	10	4.26	3.6%
119	8	5.29	4.4%	3	3.68	3.1%	11	4.73	4.0%
120	3	2.00	1.7%	3	3.71	3.1%	6	2.60	2.2%
121	2	1.34	1.1%	4	4.99	4.1%	6	2.62	2.2%
122	9	6.10	5.0%	7	8.80	7.2%	16	7.05	5.8%
123	10	6.83	5.6%	1	1.27	1.0%	11	4.88	4.0%
124	6	4.13	3.3%	6	7.67	6.2%	12	5.37	4.3%
125	2	1.39	1.1%	5	6.44	5.2%	7	3.16	2.5%
126	4	2.80	2.2%	5	6.49	5.2%	9	4.09	3.2%
127	2	1.41	1.1%	6	7.86	6.2%	8	3.67	2.9%
128	2	1.42	1.1%	5	6.60	5.2%	7	3.23	2.5%
129	5	3.58	2.8%	4	5.32	4.1%	9	4.19	3.2%
130		0.00	0.0%	2	2.68	2.1%	2	0.94	0.7%
131		0.00	0.0%	2	2.70	2.1%	2	0.95	0.7%
132	2	1.47	1.1%	1	1.36	1.0%	3	1.43	1.1%
133		0.00	0.0%	5	6.86	5.2%	5	2.40	1.8%
134	2	1.49	1.1%	4	5.53	4.1%	6	2.90	2.2%
135		0.00	0.0%	2	2.78	2.1%	2	0.97	0.7%
136	2	1.51	1.1%	4	5.61	4.1%	6	2.95	2.2%
137		0.00	0.0%	4	5.65	4.1%	4	1.98	1.4%
138		0.00	0.0%	4	5.69	4.1%	4	1.99	1.4%
139		0.00	0.0%	1	1.43	1.0%	1	0.50	0.4%
140	1	0.78	0.6%		0.00	0.0%	1	0.51	0.4%
141	2	1.57	1.1%		0.00	0.0%	2	1.02	0.7%
142	3	2.37	1.7%		0.00	0.0%	3	1.54	1.1%
143		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
144		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
145		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
146		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
147		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
150	1	0.83	0.6%		0.00	0.0%	1	0.54	0.4%
151		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
154		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
158		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
159		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
160		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
161		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
162		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
163		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
164		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
165		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
Total No.	180		65.0%	97		35.0%	277		100.0%
Mean		116.9			125.4			119.8	

Total legals	277
Total Recruits	89
Percent	32.1%
Total Post Recruits	188
Percent	67.9%

Table 5. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 656401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
98	1	0.09	0.1%		0.00	0.0%	1	0.07	0.1%
99	1	0.09	0.1%	1	0.28	0.3%	2	0.14	0.1%
100	2	0.18	0.2%		0.00	0.0%	2	0.14	0.1%
101	4	0.37	0.4%	1	0.28	0.3%	5	0.35	0.3%
102	7	0.65	0.6%	4	1.14	1.1%	11	0.77	0.8%
103	9	0.84	0.8%	5	1.44	1.4%	14	0.99	1.0%
104	17	1.61	1.5%	6	1.74	1.7%	23	1.64	1.6%
105	19	1.81	1.7%	6	1.76	1.7%	25	1.80	1.7%
106	17	1.64	1.5%	6	1.78	1.7%	23	1.67	1.6%
107	29	2.82	2.6%	10	2.99	2.8%	39	2.86	2.7%
108	16	1.57	1.5%	9	2.72	2.5%	25	1.85	1.7%
109	30	2.97	2.7%	12	3.65	3.4%	42	3.14	2.9%
110	30	3.00	2.7%	13	3.99	3.6%	43	3.24	2.9%
111	26	2.62	2.4%	6	1.86	1.7%	32	2.43	2.2%
112	29	2.95	2.6%	17	5.32	4.7%	46	3.53	3.2%
113	32	3.28	2.9%	12	3.79	3.4%	44	3.41	3.0%
114	31	3.21	2.8%	12	3.82	3.4%	43	3.36	2.9%
115	45	4.70	4.1%	12	3.85	3.4%	57	4.49	3.9%
116	56	5.90	5.1%	21	6.80	5.9%	77	6.12	5.3%
117	55	5.84	5.0%	15	4.90	4.2%	70	5.61	4.8%
118	44	4.72	4.0%	10	3.30	2.8%	54	4.37	3.7%
119	58	6.27	5.3%	10	3.32	2.8%	68	5.55	4.7%
120	53	5.78	4.8%	14	4.69	3.9%	67	5.51	4.6%
121	50	5.50	4.5%	14	4.73	3.9%	64	5.31	4.4%
122	59	6.54	5.4%	15	5.11	4.2%	74	6.19	5.1%
123	43	4.80	3.9%	16	5.50	4.5%	59	4.97	4.0%
124	32	3.60	2.9%	6	2.08	1.7%	38	3.23	2.6%
125	39	4.43	3.5%	15	5.24	4.2%	54	4.63	3.7%
126	31	3.55	2.8%	8	2.82	2.2%	39	3.37	2.7%
127	29	3.35	2.6%	8	2.84	2.2%	37	3.22	2.5%
128	40	4.65	3.6%	12	4.29	3.4%	52	4.56	3.6%
129	31	3.63	2.8%	12	4.32	3.4%	43	3.80	2.9%
130	24	2.83	2.2%	9	3.27	2.5%	33	2.94	2.3%
131	16	1.90	1.5%	7	2.56	2.0%	23	2.07	1.6%
132	19	2.28	1.7%	4	1.47	1.1%	23	2.08	1.6%
133	14	1.69	1.3%	5	1.86	1.4%	19	1.73	1.3%
134	9	1.10	0.8%		0.00	0.0%	9	0.83	0.6%
135	11	1.35	1.0%	5	1.89	1.4%	16	1.48	1.1%
136	4	0.49	0.4%	3	1.14	0.8%	7	0.65	0.5%
137	4	0.50	0.4%	7	2.68	2.0%	11	1.03	0.8%
138	5	0.63	0.5%	4	1.54	1.1%	9	0.85	0.6%
139	5	0.63	0.5%	4	1.55	1.1%	9	0.86	0.6%
140	9	1.14	0.8%	1	0.39	0.3%	10	0.96	0.7%
141		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
142	4	0.52	0.4%		0.00	0.0%	4	0.39	0.3%
143	1	0.13	0.1%		0.00	0.0%	1	0.10	0.1%
144	1	0.13	0.1%		0.00	0.0%	1	0.10	0.1%
145	2	0.26	0.2%		0.00	0.0%	2	0.20	0.1%
146	2	0.27	0.2%		0.00	0.0%	2	0.20	0.1%
147	2	0.27	0.2%		0.00	0.0%	2	0.20	0.1%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149		0.00	0.0%	1	0.42	0.3%	1	0.10	0.1%
150	2	0.27	0.2%		0.00	0.0%	2	0.21	0.1%
151		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153	1	0.14	0.1%		0.00	0.0%	1	0.10	0.1%
154		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
158		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
159		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
160		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
161	1	0.15	0.1%		0.00	0.0%	1	0.11	0.1%
162		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
163		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
164		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
165		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
Total No.	1101		75.5%	358		24.5%	1459		100.0%
Mean		119.6			119.1			119.4	

Total legals 1459

Total Recruits 345
Percent 23.6%

Total Post Recruits 1114
Percent 76.4%

Table 6. Carapace length measurement summary of sampled legal male red king crab captured in statistical area 666401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
98		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
99		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
100		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
101		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
102	1	0.18	0.2%		0.00	0.0%	1	0.12	0.1%
103	3	0.55	0.5%		0.00	0.0%	3	0.36	0.3%
104	7	1.29	1.2%	2	0.70	0.7%	9	1.09	1.0%
105	9	1.68	1.6%	2	0.71	0.7%	11	1.34	1.3%
106	6	1.13	1.1%	5	1.79	1.7%	11	1.36	1.3%
107	9	1.71	1.6%	4	1.45	1.4%	13	1.62	1.5%
108	12	2.30	2.1%	5	1.82	1.7%	17	2.14	2.0%
109	10	1.94	1.8%	5	1.84	1.7%	15	1.90	1.7%
110	15	2.93	2.7%	3	1.11	1.0%	18	2.31	2.1%
111	13	2.56	2.3%	5	1.88	1.7%	18	2.33	2.1%
112	18	3.58	3.2%	5	1.89	1.7%	23	3.00	2.7%
113	17	3.41	3.0%	4	1.53	1.4%	21	2.76	2.4%
114	16	3.24	2.8%	16	6.16	5.4%	32	4.25	3.7%
115	28	5.72	5.0%	7	2.72	2.4%	35	4.69	4.1%
116	27	5.56	4.8%	21	8.23	7.1%	48	6.48	5.6%
117	22	4.57	3.9%	17	6.72	5.7%	39	5.31	4.5%
118	34	7.13	6.0%	14	5.58	4.7%	48	6.59	5.6%
119	18	3.80	3.2%	20	8.04	6.8%	38	5.26	4.4%
120	36	7.67	6.4%	11	4.46	3.7%	47	6.57	5.5%
121	19	4.08	3.4%	15	6.13	5.1%	34	4.79	4.0%
122	27	5.85	4.8%	12	4.95	4.1%	39	5.54	4.5%
123	29	6.34	5.2%	13	5.40	4.4%	42	6.01	4.9%
124	26	5.73	4.6%	28	11.73	9.5%	54	7.80	6.3%
125	26	5.77	4.6%	8	3.38	2.7%	34	4.95	4.0%
126	21	4.70	3.7%	11	4.68	3.7%	32	4.69	3.7%
127	15	3.38	2.7%	14	6.01	4.7%	29	4.29	3.4%
128	7	1.59	1.2%	7	3.03	2.4%	14	2.09	1.6%
129	15	3.44	2.7%	9	3.92	3.0%	24	3.60	2.8%
130	18	4.16	3.2%	5	2.20	1.7%	23	3.48	2.7%
131	6	1.40	1.1%	4	1.77	1.4%	10	1.53	1.2%
132	7	1.64	1.2%	4	1.78	1.4%	11	1.69	1.3%
133	3	0.71	0.5%	4	1.80	1.4%	7	1.08	0.8%
134	7	1.67	1.2%	5	2.26	1.7%	12	1.87	1.4%
135	2	0.48	0.4%	3	1.37	1.0%	5	0.79	0.6%
136	4	0.97	0.7%	4	1.84	1.4%	8	1.27	0.9%
137	2	0.49	0.4%	1	0.46	0.3%	3	0.48	0.3%
138	3	0.74	0.5%		0.00	0.0%	3	0.48	0.3%
139	5	1.23	0.9%	1	0.47	0.3%	6	0.97	0.7%
140	4	0.99	0.7%	1	0.47	0.3%	5	0.81	0.6%
141	2	0.50	0.4%		0.00	0.0%	2	0.33	0.2%
142	4	1.01	0.7%	1	0.48	0.3%	5	0.83	0.6%
143	4	1.02	0.7%		0.00	0.0%	4	0.67	0.5%
144	2	0.51	0.4%		0.00	0.0%	2	0.34	0.2%
145	1	0.26	0.2%		0.00	0.0%	1	0.17	0.1%
146	2	0.52	0.4%		0.00	0.0%	2	0.34	0.2%
147		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
150		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
151		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
152		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
153		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
154		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
155		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
156		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
157		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
158		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
159		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
160		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
161		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
162		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
163		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
164		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
165	1	0.29	0.2%		0.00	0.0%	1	0.19	0.1%
Total No.	563		65.5%	296		34.5%	859		100.0%
Mean		120.4			120.7			120.5	

Total legals 859

Total Recruits 164
Percent 19.1%

Total Post Recruits 695
Percent 80.9%

Table 7. Percent of newly recruited male king crab by statistical area, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Statistical Area	# Crab	% Recruits	Range of % Recruits	# of vessel days sampled
36401	257	32%	26-44%	3
56401	1459	24%	4-50%	9
66401	859	19%	5-28%	6
Total	2595	23%	4-50%	18

Table 8.

Carapace length measurement summary of Prerecruit, Recruit, and Postrecruit male red king crab, captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-4, 1989.

CARA-PACE LTH. (mm)	PRERECRUIT (Sublegal) No.	FREQ. %	RECRUIT WT. No.	No.	FREQ. %	POSTRECRUIT WT. No.	No.	FREQ. %	TOTALS No.	FREQ. %
55		0.00%	0		0.00%	0		0.00%	0	0.00%
56		0.00%	0		0.00%	0		0.00%	0	0.00%
57	1	0.02%	0		0.00%	0		0.00%	1	0.02%
58	0	0.00%	0		0.00%	0		0.00%	0	0.00%
59	0	0.00%	0		0.00%	0		0.00%	0	0.00%
60	1	0.02%	0		0.00%	0		0.00%	1	0.02%
61	0	0.00%	0		0.00%	0		0.00%	0	0.00%
62	0	0.00%	0		0.00%	0		0.00%	0	0.00%
63	7	0.13%	0		0.00%	0		0.00%	7	0.13%
64	3	0.05%	0		0.00%	0		0.00%	3	0.05%
65	6	0.11%	0		0.00%	0		0.00%	6	0.11%
66	6	0.11%	0		0.00%	0		0.00%	6	0.11%
67	9	0.16%	0		0.00%	0		0.00%	9	0.16%
68	8	0.15%	0		0.00%	0		0.00%	8	0.15%
69	8	0.15%	0		0.00%	0		0.00%	8	0.15%
70	8	0.15%	0		0.00%	0		0.00%	8	0.15%
71	10	0.18%	0		0.00%	0		0.00%	10	0.18%
72	21	0.38%	0		0.00%	0		0.00%	21	0.38%
73	10	0.18%	0		0.00%	0		0.00%	10	0.18%
74	21	0.38%	0		0.00%	0		0.00%	21	0.38%
75	23	0.42%	0		0.00%	0		0.00%	23	0.42%
76	22	0.40%	0		0.00%	0		0.00%	22	0.40%
77	17	0.31%	0		0.00%	0		0.00%	17	0.31%
78	27	0.49%	0		0.00%	0		0.00%	27	0.49%
79	24	0.44%	0		0.00%	0		0.00%	24	0.44%
80	29	0.53%	0		0.00%	0		0.00%	29	0.53%
81	15	0.27%	0		0.00%	0		0.00%	15	0.27%
82	29	0.53%	0		0.00%	0		0.00%	29	0.53%
83	20	0.36%	0		0.00%	0		0.00%	20	0.36%
84	30	0.55%	0		0.00%	0		0.00%	30	0.55%
85	32	0.58%	0		0.00%	0		0.00%	32	0.58%
86	25	0.46%	0		0.00%	0		0.00%	25	0.46%
87	26	0.47%	0		0.00%	0		0.00%	26	0.47%
88	20	0.36%	0		0.00%	0		0.00%	20	0.36%
89	30	0.55%	0		0.00%	0		0.00%	30	0.55%
90	45	0.82%	0		0.00%	0		0.00%	45	0.82%
91	16	0.29%	0		0.00%	0		0.00%	16	0.29%
92	51	0.93%	0		0.00%	0		0.00%	51	0.93%
93	34	0.62%	0		0.00%	0		0.00%	34	0.62%
94	41	0.75%	0		0.00%	0		0.00%	41	0.75%
95	34	0.62%	0		0.00%	0		0.00%	34	0.62%
96	22	0.40%	0		0.00%	0		0.00%	22	0.40%
97	42	0.77%	0		0.00%	0		0.00%	42	0.77%
98	43	0.78%	2	1	0.03%	0		0.00%	45	0.82%
99	41	0.75%	2	1	0.03%	2	1	0.03%	44	0.81%
100	35	0.64%	3	2	0.06%	0		0.00%	38	0.70%
101	25	0.46%	7	4	0.13%	2	1	0.03%	34	0.61%
102	22	0.40%	17	10	0.31%	7	4	0.13%	46	0.84%
103	28	0.36%	26	15	0.47%	9	5	0.16%	54	0.99%
104	17	0.31%	50	29	0.91%	14	8	0.25%	81	1.47%
105	16	0.29%	53	31	0.97%	14	8	0.25%	83	1.52%
106	7	0.13%	50	29	0.91%	19	11	0.35%	76	1.39%
107	3	0.05%	78	45	1.42%	26	15	0.47%	106	1.94%
108	4	0.07%	60	35	1.10%	26	15	0.47%	90	1.65%
109	1	0.02%	86	50	1.57%	33	19	0.60%	120	2.19%
110	1	0.02%	83	48	1.51%	28	16	0.50%	111	2.03%
111	0	0.00%	79	46	1.45%	21	12	0.38%	100	1.82%
112	1	0.02%	100	58	1.82%	40	23	0.72%	141	2.57%
113		0.00%	95	55	1.73%	29	17	0.53%	124	2.26%
114		0.00%	105	61	1.92%	53	31	0.97%	159	2.89%
115		0.00%	135	78	2.45%	34	20	0.63%	169	3.08%
116		0.00%	0		0.00%	226	131	4.12%	226	4.12%
117		0.00%	0		0.00%	217	126	3.96%	217	3.96%
118		0.00%	0		0.00%	193	112	3.52%	193	3.52%
119		0.00%	0		0.00%	202	117	3.68%	202	3.68%
120		0.00%	0		0.00%	207	120	3.77%	207	3.77%
121		0.00%	0		0.00%	179	104	3.27%	179	3.27%
122		0.00%	0		0.00%	222	129	4.06%	222	4.06%
123		0.00%	0		0.00%	193	112	3.52%	193	3.52%
124		0.00%	0		0.00%	179	104	3.27%	179	3.27%
125		0.00%	0		0.00%	164	95	2.99%	164	2.99%
126		0.00%	0		0.00%	138	80	2.52%	138	2.52%
127		0.00%	0		0.00%	128	74	2.33%	128	2.33%
128		0.00%	0		0.00%	126	73	2.30%	126	2.30%
129		0.00%	0		0.00%	131	76	2.39%	131	2.39%
130		0.00%	0		0.00%	100	58	1.82%	100	1.82%
131		0.00%	0		0.00%	60	35	1.10%	60	1.10%
132		0.00%	0		0.00%	64	37	1.16%	64	1.16%
133		0.00%	0		0.00%	53	31	0.97%	53	0.97%
134		0.00%	0		0.00%	47	27	0.85%	47	0.85%
135		0.00%	0		0.00%	40	23	0.72%	40	0.72%
136		0.00%	0		0.00%	36	21	0.66%	36	0.66%
137		0.00%	0		0.00%	31	18	0.57%	31	0.57%
138		0.00%	0		0.00%	28	16	0.50%	28	0.50%
139		0.00%	0		0.00%	28	16	0.50%	28	0.50%
140		0.00%	0		0.00%	28	16	0.50%	28	0.50%
141		0.00%	0		0.00%	7	4	0.13%	7	0.13%
142		0.00%	0		0.00%	21	12	0.38%	21	0.38%
143		0.00%	0		0.00%	9	5	0.16%	9	0.16%
144		0.00%	0		0.00%	5	3	0.09%	5	0.09%
145		0.00%	0		0.00%	5	3	0.09%	5	0.09%
146		0.00%	0		0.00%	7	4	0.13%	7	0.13%
147		0.00%	0		0.00%	3	2	0.06%	3	0.06%
148		0.00%	0		0.00%	0		0.00%	0	0.00%
149		0.00%	0		0.00%	2	1	0.03%	2	0.03%
150		0.00%	0		0.00%	5	3	0.09%	5	0.09%
151		0.00%	0		0.00%	0		0.00%	0	0.00%
152		0.00%	0		0.00%	0		0.00%	0	0.00%
153		0.00%	0		0.00%	2	1	0.03%	2	0.03%
154		0.00%	0		0.00%	0		0.00%	0	0.00%
155		0.00%	0		0.00%	0		0.00%	0	0.00%
156		0.00%	0		0.00%	0		0.00%	0	0.00%
157		0.00%	0		0.00%	0		0.00%	0	0.00%
158		0.00%	0		0.00%	0		0.00%	0	0.00%
159		0.00%	0		0.00%	0		0.00%	0	0.00%
160		0.00%	0		0.00%	0		0.00%	0	0.00%
161		0.00%	0		0.00%	2	1	0.03%	2	0.03%
162		0.00%	0		0.00%	0		0.00%	0	0.00%
163		0.00%	0		0.00%	0		0.00%	0	0.00%
164		0.00%	0		0.00%	0		0.00%	0	0.00%
165		0.00%	0		0.00%	2	1	0.03%	2	0.03%
Total M	1009	18.40%	1031	595	18.80%	3444	1997	62.80%	5485	100.00%

Table 9. Observer summary table of red king crab weight samples by statistical area, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Statistical Area	# Crab	Weight lbs.	Average Weight	Range of Ave. wts.	# vessel days sampled
636401	60	201.5	3.4	3.2-3.5	3
656401	247	748.0	3.0	2.8-3.6	11
666401	152	482.6	3.2	3.1-3.3	5
Total	459	1432.1	3.12	2.8-3.6	19

Total number of days sampled for weights by observer vessels.

Table 10. Carapace length measurement summary of sampled sublegal male red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1-4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	1	0.22	0.4%	1	0.06	0.1%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	1	0.08	0.1%	0	0.00	0.0%	1	0.06	0.1%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	6	0.50	0.8%	1	0.25	0.4%	7	0.44	0.7%
64	2	0.17	0.3%	1	0.25	0.4%	3	0.19	0.3%
65	4	0.34	0.5%	2	0.51	0.8%	6	0.39	0.6%
66	6	0.53	0.8%	0	0.00	0.0%	6	0.39	0.6%
67	9	0.80	1.2%	0	0.00	0.0%	9	0.60	0.9%
68	1	0.09	0.1%	7	1.87	2.7%	8	0.54	0.8%
69	8	0.73	1.1%	0	0.00	0.0%	8	0.55	0.8%
70	7	0.65	0.9%	1	0.27	0.4%	8	0.56	0.8%
71	9	0.85	1.2%	1	0.28	0.4%	10	0.70	1.0%
72	16	1.53	2.1%	5	1.41	2.0%	21	1.50	2.1%
73	9	0.87	1.2%	1	0.29	0.4%	10	0.72	1.0%
74	19	1.86	2.5%	2	0.58	0.8%	21	1.54	2.1%
75	23	2.29	3.1%	0	0.00	0.0%	23	1.71	2.3%
76	18	1.81	2.4%	4	1.19	1.6%	22	1.66	2.2%
77	14	1.43	1.9%	3	0.91	1.2%	17	1.30	1.7%
78	25	2.59	3.3%	2	0.61	0.8%	27	2.09	2.7%
79	20	2.10	2.7%	4	1.24	1.6%	24	1.88	2.4%
80	26	2.76	3.4%	3	0.94	1.2%	29	2.30	2.9%
81	10	1.07	1.3%	5	1.59	2.0%	15	1.20	1.5%
82	19	2.07	2.5%	10	3.22	3.9%	29	2.36	2.9%
83	19	2.09	2.5%	1	0.33	0.4%	20	1.65	2.0%
84	26	2.90	3.4%	4	1.32	1.6%	30	2.50	3.0%
85	25	2.82	3.3%	7	2.33	2.7%	32	2.70	3.2%
86	21	2.40	2.8%	4	1.35	1.6%	25	2.13	2.5%
87	16	1.85	2.1%	10	3.41	3.9%	26	2.24	2.6%
88	16	1.87	2.1%	4	1.38	1.6%	20	1.74	2.0%
89	26	3.07	3.4%	4	1.40	1.6%	30	2.65	3.0%
90	36	4.30	4.8%	9	3.18	3.5%	45	4.01	4.5%
91	14	1.69	1.9%	2	0.71	0.8%	16	1.44	1.6%
92	40	4.88	5.3%	11	3.97	4.3%	51	4.65	5.1%
93	22	2.71	2.9%	12	4.38	4.7%	34	3.13	3.4%
94	27	3.37	3.6%	14	5.16	5.5%	41	3.82	4.1%
95	28	3.53	3.7%	6	2.24	2.4%	34	3.20	3.4%
96	16	2.04	2.1%	6	2.26	2.4%	22	2.09	2.2%
97	28	3.60	3.7%	14	5.33	5.5%	42	4.04	4.2%
98	28	3.64	3.7%	15	5.76	5.9%	43	4.18	4.3%
99	25	3.28	3.3%	16	6.21	6.3%	41	4.02	4.1%
100	24	3.18	3.2%	11	4.31	4.3%	35	3.47	3.5%
101	11	1.47	1.5%	14	5.55	5.5%	25	2.50	2.5%
102	12	1.62	1.6%	10	4.00	3.9%	22	2.22	2.2%
103	17	2.32	2.3%	3	1.21	1.2%	20	2.04	2.0%
104	8	1.10	1.1%	9	3.67	3.5%	17	1.75	1.7%
105	9	1.25	1.2%	7	2.88	2.7%	16	1.67	1.6%
106	0	0.00	0.0%	7	2.91	2.7%	7	0.74	0.7%
107	3	0.43	0.4%	0	0.00	0.0%	3	0.32	0.3%
108	2	0.29	0.3%	2	0.85	0.8%	4	0.43	0.4%
109	1	0.14	0.1%	0	0.00	0.0%	1	0.11	0.1%
110	1	0.15	0.1%	0	0.00	0.0%	1	0.11	0.1%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	1	0.15	0.1%	0	0.00	0.0%	1	0.11	0.1%
sum	754		74.7%	255		25.3%	1009		100.0%
Mean		87.2			91.7			88.4	

Total sublegals 1009

Table 11. Carapace length measurement summary of sampled sublegal male red king crab captured in statistical area 636401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	2	0.82	1.3%	0	0.00	0.0%	2	0.69	1.1%
64	1	0.42	0.6%	0	0.00	0.0%	1	0.35	0.5%
65	1	0.42	0.6%	0	0.00	0.0%	1	0.36	0.5%
66	2	0.86	1.3%	0	0.00	0.0%	2	0.73	1.1%
67	2	0.87	1.3%	0	0.00	0.0%	2	0.74	1.1%
68	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
69	1	0.45	0.6%	0	0.00	0.0%	1	0.38	0.5%
70	1	0.45	0.6%	0	0.00	0.0%	1	0.38	0.5%
71	5	2.31	3.2%	0	0.00	0.0%	5	1.95	2.7%
72	2	0.94	1.3%	0	0.00	0.0%	2	0.79	1.1%
73	3	1.42	1.9%	0	0.00	0.0%	3	1.20	1.6%
74	9	4.32	5.8%	0	0.00	0.0%	9	3.66	4.9%
75	5	2.44	3.2%	0	0.00	0.0%	5	2.06	2.7%
76	7	3.45	4.5%	0	0.00	0.0%	7	2.92	3.8%
77	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
78	7	3.55	4.5%	0	0.00	0.0%	7	3.00	3.8%
79	8	4.10	5.2%	0	0.00	0.0%	8	3.47	4.4%
80	4	2.08	2.6%	0	0.00	0.0%	4	1.76	2.2%
81	2	1.05	1.3%	0	0.00	0.0%	2	0.89	1.1%
82	6	3.19	3.9%	1	2.93	3.6%	7	3.15	3.8%
83	3	1.62	1.9%	0	0.00	0.0%	3	1.37	1.6%
84	7	3.82	4.5%	0	0.00	0.0%	7	3.23	3.8%
85	3	1.66	1.9%	0	0.00	0.0%	3	1.40	1.6%
86	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
87	5	2.82	3.2%	0	0.00	0.0%	5	2.39	2.7%
88	3	1.71	1.9%	0	0.00	0.0%	3	1.45	1.6%
89	3	1.73	1.9%	0	0.00	0.0%	3	1.47	1.6%
90	4	2.34	2.6%	0	0.00	0.0%	4	1.98	2.2%
91	1	0.59	0.6%	0	0.00	0.0%	1	0.50	0.5%
92	8	4.78	5.2%	2	6.57	7.1%	10	5.05	5.5%
93	2	1.21	1.3%	0	0.00	0.0%	2	1.02	1.1%
94	7	4.27	4.5%	2	6.71	7.1%	9	4.65	4.9%
95	6	3.70	3.9%	0	0.00	0.0%	6	3.13	3.3%
96	4	2.49	2.6%	2	6.86	7.1%	6	3.16	3.3%
97	8	5.04	5.2%	3	10.39	10.7%	11	5.86	6.0%
98	5	3.18	3.2%	2	7.00	7.1%	7	3.77	3.8%
99	2	1.29	1.3%	2	7.07	7.1%	4	2.18	2.2%
100	4	2.60	2.6%	1	3.57	3.6%	5	2.75	2.7%
101	2	1.31	1.3%	6	21.64	21.4%	8	4.44	4.4%
102	2	1.32	1.3%	1	3.64	3.6%	3	1.68	1.6%
103	5	3.34	3.2%	2	7.36	7.1%	7	3.96	3.8%
104	0	0.00	0.0%	1	3.71	3.6%	1	0.57	0.5%
105	1	0.68	0.6%	2	7.50	7.1%	3	1.73	1.6%
106	0	0.00	0.0%	1	3.79	3.6%	1	0.58	0.5%
107	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
108	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
109	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
110	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	1	0.73	0.6%	0	0.00	0.0%	1	0.62	0.5%
sum	154		84.6%	28		15.4%	182		100.0%
Mean		85.4			98.8			87.4	

Total sublegals 182

Table 12. Carapace length measurement summary of sampled male red king crab captured in statistical area 656401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	1	0.34	0.6%	1	0.09	0.2%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	1	0.14	0.2%	0	0.00	0.0%	1	0.10	0.2%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	3	0.43	0.7%	1	0.38	0.6%	4	0.42	0.7%
64	1	0.15	0.2%	1	0.38	0.6%	2	0.21	0.3%
65	2	0.30	0.5%	1	0.39	0.6%	3	0.32	0.5%
66	3	0.45	0.7%	0	0.00	0.0%	3	0.33	0.5%
67	3	0.46	0.7%	0	0.00	0.0%	3	0.33	0.5%
68	0	0.00	0.0%	3	1.21	1.8%	3	0.34	0.5%
69	4	0.63	0.9%	0	0.00	0.0%	4	0.45	0.7%
70	3	0.48	0.7%	1	0.42	0.6%	4	0.46	0.7%
71	3	0.49	0.7%	1	0.42	0.6%	4	0.47	0.7%
72	9	1.48	2.1%	3	1.29	1.8%	12	1.42	2.0%
73	5	0.83	1.1%	1	0.43	0.6%	6	0.72	1.0%
74	10	1.69	2.3%	1	0.44	0.6%	11	1.34	1.8%
75	10	1.71	2.3%	0	0.00	0.0%	10	1.24	1.6%
76	8	1.38	1.8%	4	1.81	2.4%	12	1.50	2.0%
77	7	1.23	1.6%	2	0.92	1.2%	9	1.14	1.5%
78	15	2.67	3.4%	2	0.93	1.2%	17	2.18	2.8%
79	11	1.98	2.5%	3	1.41	1.8%	14	1.82	2.3%
80	13	2.37	3.0%	1	0.48	0.6%	14	1.85	2.3%
81	6	1.11	1.4%	3	1.45	1.8%	9	1.20	1.5%
82	8	1.49	1.8%	7	3.42	4.2%	15	2.03	2.5%
83	14	2.65	3.2%	1	0.49	0.6%	15	2.05	2.5%
84	14	2.68	3.2%	2	1.00	1.2%	16	2.21	2.6%
85	13	2.52	3.0%	6	3.04	3.6%	19	2.66	3.1%
86	16	3.13	3.6%	4	2.05	2.4%	20	2.83	3.3%
87	9	1.78	2.1%	8	4.14	4.8%	17	2.44	2.8%
88	9	1.80	2.1%	3	1.57	1.8%	12	1.74	2.0%
89	18	3.65	4.1%	3	1.59	1.8%	21	3.08	3.5%
90	24	4.92	5.5%	8	4.29	4.8%	32	4.74	5.3%
91	9	1.87	2.1%	0	0.00	0.0%	9	1.35	1.5%
92	26	5.45	5.9%	7	3.83	4.2%	33	5.00	5.4%
93	19	4.03	4.3%	10	5.54	6.0%	29	4.44	4.8%
94	15	3.21	3.4%	10	5.60	6.0%	25	3.87	4.1%
95	12	2.60	2.7%	5	2.83	3.0%	17	2.66	2.8%
96	7	1.53	1.6%	4	2.29	2.4%	11	1.74	1.8%
97	19	4.20	4.3%	6	3.46	3.6%	25	4.00	4.1%
98	17	3.79	3.9%	8	4.67	4.8%	25	4.04	4.1%
99	22	4.96	5.0%	12	7.07	7.1%	34	5.55	5.6%
100	20	4.56	4.6%	8	4.76	4.8%	28	4.61	4.6%
101	5	1.15	1.1%	8	4.81	4.8%	13	2.16	2.1%
102	7	1.63	1.6%	7	4.25	4.2%	14	2.35	2.3%
103	8	1.88	1.8%	1	0.61	0.6%	9	1.53	1.5%
104	6	1.42	1.4%	4	2.48	2.4%	10	1.71	1.6%
105	4	0.96	0.9%	3	1.88	1.8%	7	1.21	1.2%
106	0	0.00	0.0%	4	2.52	2.4%	4	0.70	0.7%
107	1	0.24	0.2%	0	0.00	0.0%	1	0.18	0.2%
108	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
109	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
110	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
sum	439		72.3%	168		27.7%	607		100.0%
Mean		88.0			90.9			88.8	

Total sublegals 607

Table 13. Carapace length measurement summary of sampled male red king crab captured in statistical area 666401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	1	0.47	0.7%	0	0.00	0.0%	1	0.35	0.6%
64	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
65	1	0.49	0.7%	1	1.41	2.2%	2	0.72	1.1%
66	1	0.49	0.7%	0	0.00	0.0%	1	0.37	0.6%
67	4	2.00	3.0%	0	0.00	0.0%	4	1.49	2.2%
68	0	0.00	0.0%	3	4.43	6.5%	3	1.13	1.7%
69	2	1.03	1.5%	0	0.00	0.0%	2	0.77	1.1%
70	3	1.57	2.2%	0	0.00	0.0%	3	1.17	1.7%
71	1	0.53	0.7%	0	0.00	0.0%	1	0.39	0.6%
72	4	2.15	3.0%	2	3.13	4.3%	6	2.40	3.3%
73	1	0.54	0.7%	0	0.00	0.0%	1	0.41	0.6%
74	0	0.00	0.0%	1	1.61	2.2%	1	0.41	0.6%
75	7	3.92	5.2%	0	0.00	0.0%	7	2.92	3.9%
76	3	1.70	2.2%	0	0.00	0.0%	3	1.27	1.7%
77	5	2.87	3.7%	1	1.67	2.2%	6	2.57	3.3%
78	3	1.75	2.2%	0	0.00	0.0%	3	1.30	1.7%
79	1	0.59	0.7%	1	1.72	2.2%	2	0.88	1.1%
80	8	4.78	6.0%	2	3.48	4.3%	10	4.44	5.6%
81	2	1.21	1.5%	2	3.52	4.3%	4	1.80	2.2%
82	5	3.06	3.7%	2	3.57	4.3%	7	3.19	3.9%
83	2	1.24	1.5%	0	0.00	0.0%	2	0.92	1.1%
84	3	1.88	2.2%	1	1.83	2.2%	4	1.87	2.2%
85	4	2.54	3.0%	1	1.85	2.2%	5	2.36	2.8%
86	4	2.57	3.0%	0	0.00	0.0%	4	1.91	2.2%
87	2	1.30	1.5%	2	3.78	4.3%	4	1.93	2.2%
88	4	2.63	3.0%	0	0.00	0.0%	4	1.96	2.2%
89	3	1.99	2.2%	1	1.93	2.2%	4	1.98	2.2%
90	7	4.70	5.2%	1	1.96	2.2%	8	4.00	4.4%
91	3	2.04	2.2%	1	1.98	2.2%	4	2.02	2.2%
92	6	4.12	4.5%	1	2.00	2.2%	7	3.58	3.9%
93	1	0.69	0.7%	1	2.02	2.2%	2	1.03	1.1%
94	4	2.81	3.0%	2	4.09	4.3%	6	3.13	3.3%
95	5	3.54	3.7%	1	2.07	2.2%	6	3.17	3.3%
96	5	3.58	3.7%	0	0.00	0.0%	5	2.67	2.8%
97	1	0.72	0.7%	5	10.54	10.9%	6	3.23	3.3%
98	6	4.39	4.5%	2	4.26	4.3%	8	4.36	4.4%
99	1	0.74	0.7%	2	4.30	4.3%	3	1.65	1.7%
100	0	0.00	0.0%	1	2.17	2.2%	1	0.56	0.6%
101	2	1.51	1.5%	0	0.00	0.0%	2	1.12	1.1%
102	3	2.28	2.2%	1	2.22	2.2%	4	2.27	2.2%
103	4	3.07	3.0%	0	0.00	0.0%	4	2.29	2.2%
104	2	1.55	1.5%	3	6.78	6.5%	5	2.89	2.8%
105	4	3.13	3.0%	2	4.57	4.3%	6	3.50	3.3%
106	0	0.00	0.0%	2	4.61	4.3%	2	1.18	1.1%
107	2	1.60	1.5%	0	0.00	0.0%	2	1.19	1.1%
108	2	1.61	1.5%	1	2.35	2.2%	3	1.80	1.7%
109	1	0.81	0.7%	0	0.00	0.0%	1	0.61	0.6%
110	1	0.82	0.7%	0	0.00	0.0%	1	0.61	0.6%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
sum	134		74.4%	46		25.6%	180		100.0%
Mean		87.0			89.8			87.7	

Total sublegals 180

Table 14. Carapace length measurement summary of sampled sublegal male red king crab captured in statistical area 656330 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
64	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
65	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
66	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
67	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
68	1	3.58	5.3%	1	6.80	10.0%	2	4.69	6.9%
69	1	3.63	5.3%	0	0.00	0.0%	1	2.38	3.4%
70	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
71	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
72	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
73	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
74	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
75	1	3.95	5.3%	0	0.00	0.0%	1	2.59	3.4%
76	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
77	1	4.05	5.3%	0	0.00	0.0%	1	2.66	3.4%
78	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
79	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
80	1	4.21	5.3%	0	0.00	0.0%	1	2.76	3.4%
81	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
82	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
83	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
84	1	4.42	5.3%	1	8.40	10.0%	2	5.79	6.9%
85	3	13.42	15.8%	0	0.00	0.0%	3	8.79	10.3%
86	1	4.53	5.3%	0	0.00	0.0%	1	2.97	3.4%
87	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
88	0	0.00	0.0%	1	8.80	10.0%	1	3.03	3.4%
89	1	4.68	5.3%	0	0.00	0.0%	1	3.07	3.4%
90	1	4.74	5.3%	0	0.00	0.0%	1	3.10	3.4%
91	1	4.79	5.3%	1	9.10	10.0%	2	6.28	6.9%
92	0	0.00	0.0%	1	9.20	10.0%	1	3.17	3.4%
93	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
94	1	4.95	5.3%	0	0.00	0.0%	1	3.24	3.4%
95	3	15.00	15.8%	0	0.00	0.0%	3	9.83	10.3%
96	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
97	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
98	0	0.00	0.0%	3	29.40	30.0%	3	10.14	10.3%
99	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
100	0	0.00	0.0%	1	10.00	10.0%	1	3.45	3.4%
101	2	10.63	10.5%	0	0.00	0.0%	2	6.97	6.9%
102	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
103	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
104	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
105	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
106	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
107	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
108	0	0.00	0.0%	1	10.80	10.0%	1	3.72	3.4%
109	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
110	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
sum	19		65.5%	10		34.5%	29		100.0%
Mean		86.6			92.5			88.6	

Total sublegals 29

Table 15. Carapace length measurement summary of sampled sublegal male red king crab captured in statistical area 666330 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Carapace Length (mm)	New Shell			Old Shell			Total		
	No.	Ave Length Calc	%	No.	Ave Length Calc	%	No.	Ave Length Calc	%
57	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
58	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
59	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
60	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
61	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
62	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
63	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
64	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
65	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
66	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
67	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
68	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
69	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
70	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
71	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
72	1	9.00	12.5%	0	0.00	0.0%	1	6.55	9.1%
73	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
74	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
75	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
76	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
77	1	9.63	12.5%	0	0.00	0.0%	1	7.00	9.1%
78	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
79	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
80	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
81	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
82	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
83	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
84	1	10.50	12.5%	0	0.00	0.0%	1	7.64	9.1%
85	2	21.25	25.0%	0	0.00	0.0%	2	15.45	18.2%
86	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
87	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
88	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
89	1	11.13	12.5%	0	0.00	0.0%	1	8.09	9.1%
90	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
91	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
92	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
93	0	0.00	0.0%	1	31.00	33.3%	1	8.45	9.1%
94	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
95	2	23.75	25.0%	0	0.00	0.0%	2	17.27	18.2%
96	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
97	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
98	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
99	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
100	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
101	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
102	0	0.00	0.0%	1	34.00	33.3%	1	9.27	9.1%
103	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
104	0	0.00	0.0%	1	34.67	33.3%	1	9.45	9.1%
105	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
106	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
107	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
108	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
109	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
110	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
111	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
112	0	0.00	0.0%	0	0.00	0.0%	0	0.00	0.0%
sum	8		72.7%	3		27.3%	11		100.0%
Mean		85.3			99.7			89.2	

Total sublegals 11

Table 16. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Stat.Area All Vessel All 8 1-4 89 Recorder JGG

JUVENILE		ADULT SIZE PER % OVIGERITY							ADULT SIZE PER % OVIGERITY						
mm	no.	mm	Full	Hi	Med	Low	0	Sum	mm	Full	Hi	Med	Low	0	Sum
50		60						0	91	2					2
51		61				1		1	92	4	2				6
52		62	1					1	93	4	2				6
53		63		1				1	94	3	3	2			8
54		64	1	1		1		3	95		2				2
55		65	1	2				3	96	1					1
56		66	3	1		1		5	97						0
57		67						0	98	1					1
58		68	2	1	1	1		5	99	3					3
59	2	69	2	1	2	1		6	100	1		1			2
60		70	3	4	3			10	101	1					1
61		71	2	2				4	102						0
62		72	2	4	1	2		9	103						0
63	2	73	3	6	2			11	104	1					1
64	1	74	7	7	2			16	105						0
65	1	75	10	4	4	2	2	22	106	2					2
66	4	76	6	3	3			12	107						0
67	4	77	7	9	3	1	2	22	108						0
68	3	78	8	7	5	1		21	109						0
69	3	79	9	6	3		1	19	110						0
70	7	80	8	3	3		1	15	111						0
71	3	81	5	3	2	1	1	12	112	1	1				2
72	2	82	2	7	4	1		14	113						0
73		83	5	8				13	114						0
74	3	84	3	3	2			8	115						0
75		85	7	3		1		11	116						0
76		86	4	3				7	117						0
77		87	5	1	1			7	118						0
78		88	2	2				4	119						0
79		89	4	1	3			8	120						0
80		90	8					8	121						0
									122						0
35		120	93	44	14	7	278		24	10	3	0	0	37	

TOTAL ADULTS/OVIGERITY - - 144 103 47 14 7 315

% ADULTS/OVIGERITY - - - 45.7 32.7 14.9 4.4 2.2

MEAN 68.1 WEIGHTED MEAN ADULT LENGTH - - 80.1

VAR. 13.4 VARIANCE OF THE MEAN LENGTH -- 72.6

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%

Table 17. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured in statistical area 636401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Stat.Area 636401 Vessel All 8 1-4 89 Recorder JGG

JUVENILE		ADULT SIZE PER % OVIGERITY							ADULT SIZE PER % OVIGERITY						
mm	no.	mm	Full	Hi	Med	Low	0	Sum	mm	Full	Hi	Med	Low	0	Sum
50		60						0	91						0
51		61						0	92						0
52		62						0	93	2					2
53		63						0	94	1					1
54		64		1				1	95						0
55		65						0	96	1					1
56		66						0	97						0
57		67						0	98						0
58		68	1	1				2	99						0
59	2	69						0	100	1					1
60		70						0	101						0
61		71	2					2	102						0
62		72	1	1				2	103						0
63	2	73		1				1	104	1					1
64	1	74	4	1				5	105						0
65		75	3		1			4	106						0
66	3	76	2		1			3	107						0
67	3	77					1	1	108						0
68	2	78	1	2				3	109						0
69	3	79	2				1	3	110						0
70	1	80						0	111						0
71		81	1					1	112						0
72	2	82						0	113						0
73		83	2	1				3	114						0
74	1	84	1					1	115						0
75		85	1					1	116						0
76		86	1					1	117						0
77		87	1					1	118						0
78		88						0	119						0
79		89	1					1	120						0
80		90	1					1	121						0
									122						0
20		25		8	2	0	2	37		6		0	0	0	6

TOTAL ADULTS/OVIGERITY - - 31 8 2 0 2 43

% ADULTS/OVIGERITY - - - 72.1 18.6 4.7 0.0 4.7

MEAN 66.9 WEIGHTED MEAN ADULT LENGTH - 79.9

VAR. 15.5 VARIANCE OF THE MEAN LENGTH - 79.4

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%

Table 18. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured in statistical area 656401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Stat.Area 656401 Vessel All 8 1-4 89 Recorder JGG

JUVENILE mm	no.	ADULT SIZE PER % OVIGERITY mm	Full	Hi	Med	Low	0	Sum	ADULT SIZE PER % OVIGERITY mm	Full	Hi	Med	Low	0	Sum
50		60						0	91	1					1
51		61						0	92	3	1				4
52		62	1					1	93		1				1
53		63						0	94	2	1				3
54		64	1					1	95		2				2
55		65	1					1	96						0
56		66	3					3	97						0
57		67						0	98	1					1
58		68	1		1			2	99	3					3
59		69	2					2	100						0
60		70	3	2	2			7	101	1					1
61		71		1				1	102						0
62		72	1	1				2	103						0
63		73	2	2	1			5	104						0
64		74	3	3	1			7	105						0
65	1	75	2	3	1		2	8	106	1					1
66	1	76	2	3	1			6	107						0
67		77	4	3	3		1	11	108						0
68	1	78	5	3	3			11	109						0
69		79	7	4	1			12	110						0
70	5	80	8	2	1		1	12	111						0
71	3	81	3	2			1	6	112	1	1				2
72		82	2	6	2			10	113						0
73		83	2	4				6	114						0
74	2	84	2	2				4	115						0
75		85	3	3		1		7	116						0
76		86	3	2				5	117						0
77		87	3	1				4	118						0
78		88	1	1				2	119						0
79		89	3	1	2			6	120						0
80		90	4					4	121						0
									122						0
13			72	49	19	1	5	146		13	6	0	0	0	19

TOTAL ADULTS/OVIGERITY - - 85 55 19 1 5 165

% ADULTS/OVIGERITY - - - 51.5 33.3 11.5 0.6 3.0

MEAN 70.0 WEIGHTED MEAN ADULT LENGTH - 80.9

VAR. 6.7 VARIANCE OF THE MEAN LENGTH - 72.2

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%

Table 19. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured in statistical area 666401 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

Stat.Area 666401 Vessel All 8 1-4 89 Recorder JGG

JUVENILE mm	no.	ADULT SIZE PER % OVIGERITY mm	Full	Hi	Med	Low	0	Sum	ADULT SIZE PER % OVIGERITY mm	Full	Hi	Med	Low	0	Sum
50		60						0	91	1					1
51		61				1		1	92	1	1				2
52		62						0	93	1	1				2
53		63		1				1	94		2	2			4
54		64				1		1	95						0
55		65		2				2	96						0
56		66		1		1		2	97						0
57		67						0	98						0
58		68				1		1	99						0
59		69		1	2	1		4	100			1			1
60		70		2	1			3	101						0
61		71		1				1	102						0
62		72		2	1	2		5	103						0
63		73	1	3	1			5	104						0
64		74		3	1			4	105						0
65		75	5	1	2	2		10	106	1					1
66		76	2		1			3	107						0
67	1	77	3	6		1		10	108						0
68		78	2	2	2	1		7	109						0
69		79		2	2			4	110						0
70	1	80		1	2			3	111						0
71		81	1	1	2	1		5	112						0
72		82		1	2	1		4	113						0
73		83	1	3				4	114						0
74		84		1	2			3	115						0
75		85	3					3	116						0
76		86						0	117						0
77		87	1		1			2	118						0
78		88	1	1				2	119						0
79		89			1			1	120						0
80		90	3					3	121						0
									122						0
2			23	35	23	13	0	94		4	4	3	0	0	11

TOTAL ADULTS/OVIGERITY - - 27 39 26 13 0 105

% ADULTS/OVIGERITY - - - 25.7 37.1 24.8 12.4 0.0

MEAN 68.5 WEIGHTED MEAN ADULT LENGTH - - 78.8

VAR. 4.5 VARIANCE OF THE MEAN LENGTH -- 68.5

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%

Table 20. Carapace length measurement and percent ovigerity summary of sampled female red king crab captured in statistical area 656330 during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

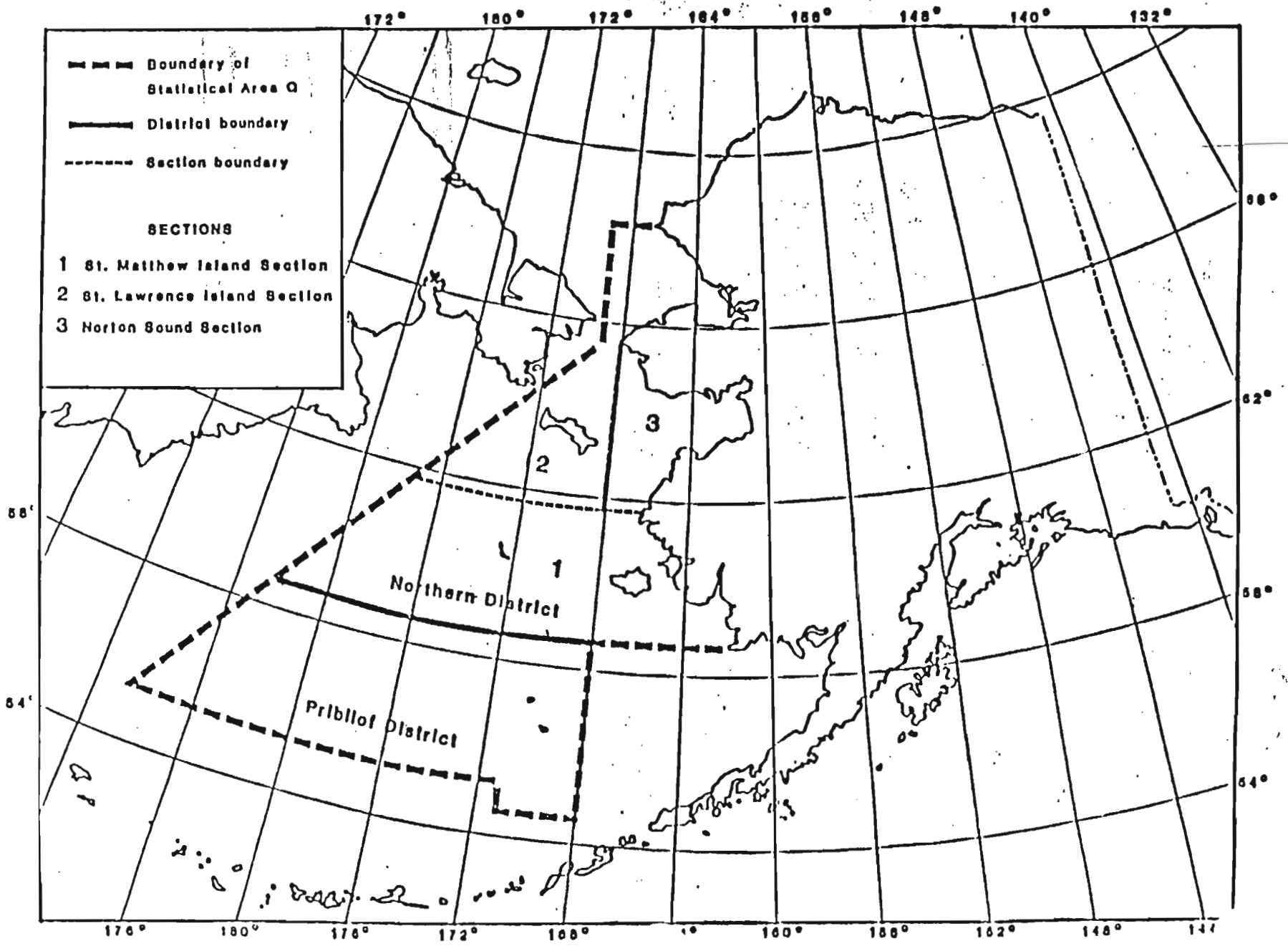
Stat.Area 656330 Vessel All 8 1-4 89 Recorder JGG

JUVENILE	ADULT SIZE PER % OVIGERITY						ADULT SIZE PER % OVIGERITY						
mm no.	mm	Full	Hi	Med	Low	0 Sum	mm	Full	Hi	Med	Low	0	Sum
50	60					0	91						0
51	61					0	92						0
52	62					0	93	1					1
53	63					0	94						0
54	64					0	95						0
55	65					0	96						0
56	66					0	97						0
57	67					0	98						0
58	68					0	99						0
59	69					0	100						0
60	70					0	101						0
61	71					0	102						0
62	72					0	103						0
63	73					0	104						0
64	74					0	105						0
65	75					0	106						0
66	76					0	107						0
67	77					0	108						0
68	78					0	109						0
69	79					0	110						0
70	80					0	111						0
71	81					0	112						0
72	82					0	113						0
73	83					0	114						0
74	84					0	115						0
75	85					0	116						0
76	86		1			1	117						0
77	87					0	118						0
78	88					0	119						0
79	89					0	120						0
80	90					0	121						0
							122						0
0	0		1	0	0	0 1		1	0	0	0	0	1
	TOTAL ADULTS/OVIGERITY - -							1	1	0	0	0	2
	% ADULTS/OVIGERITY - - - -							50	50	0	0	0	

MEAN WEIGHTED MEAN ADULT LENGTH - - 89.5

VAR. VARIANCE OF THE MEAN LENGTH -- 24.5

Full=90-100%, Hi=60-89%, Med=30-59%, Lo=1-29%



re 1. King crab fishing districts and sections of Statistical Area Q

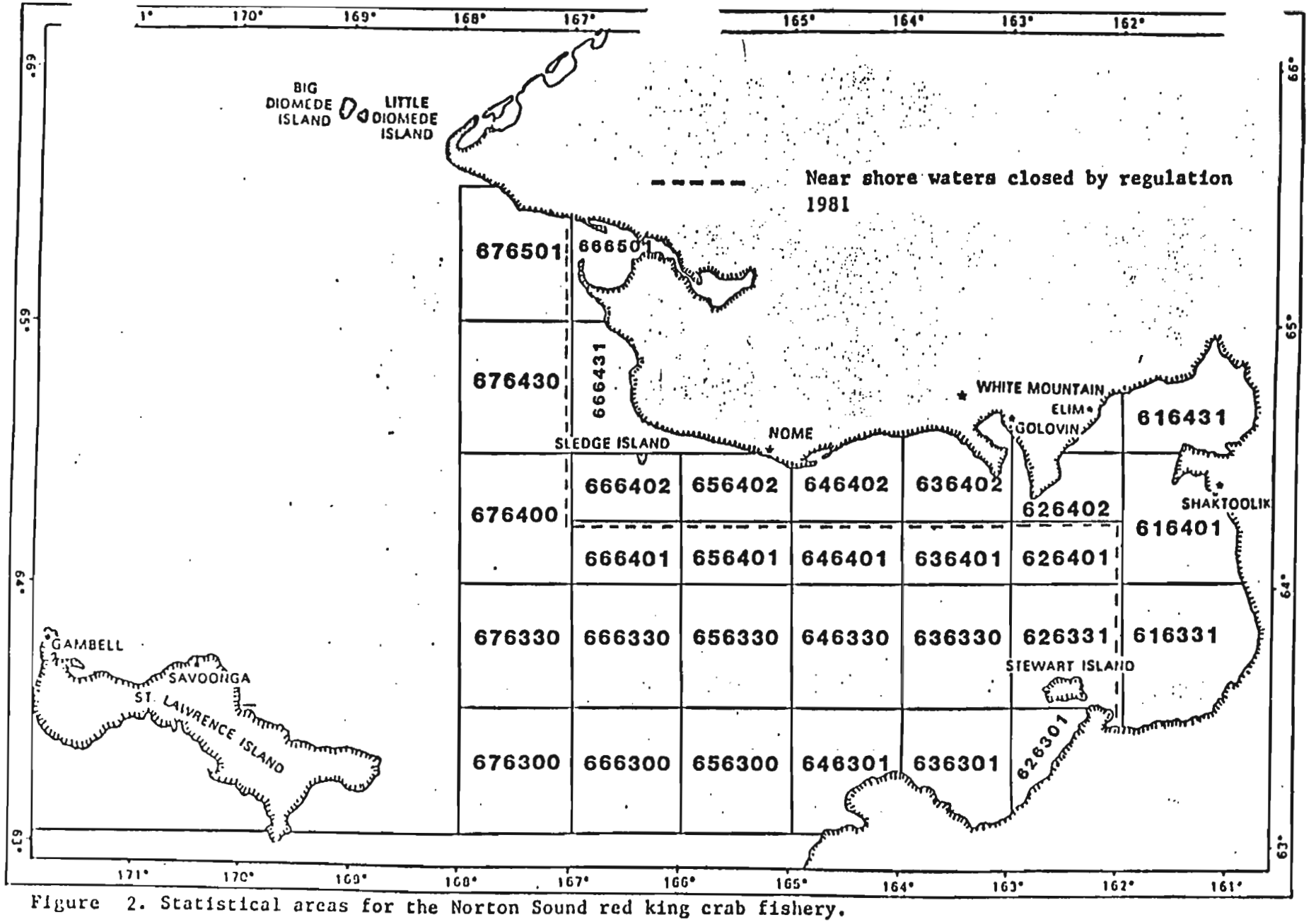


Figure 2. Statistical areas for the Norton Sound red king crab fishery.

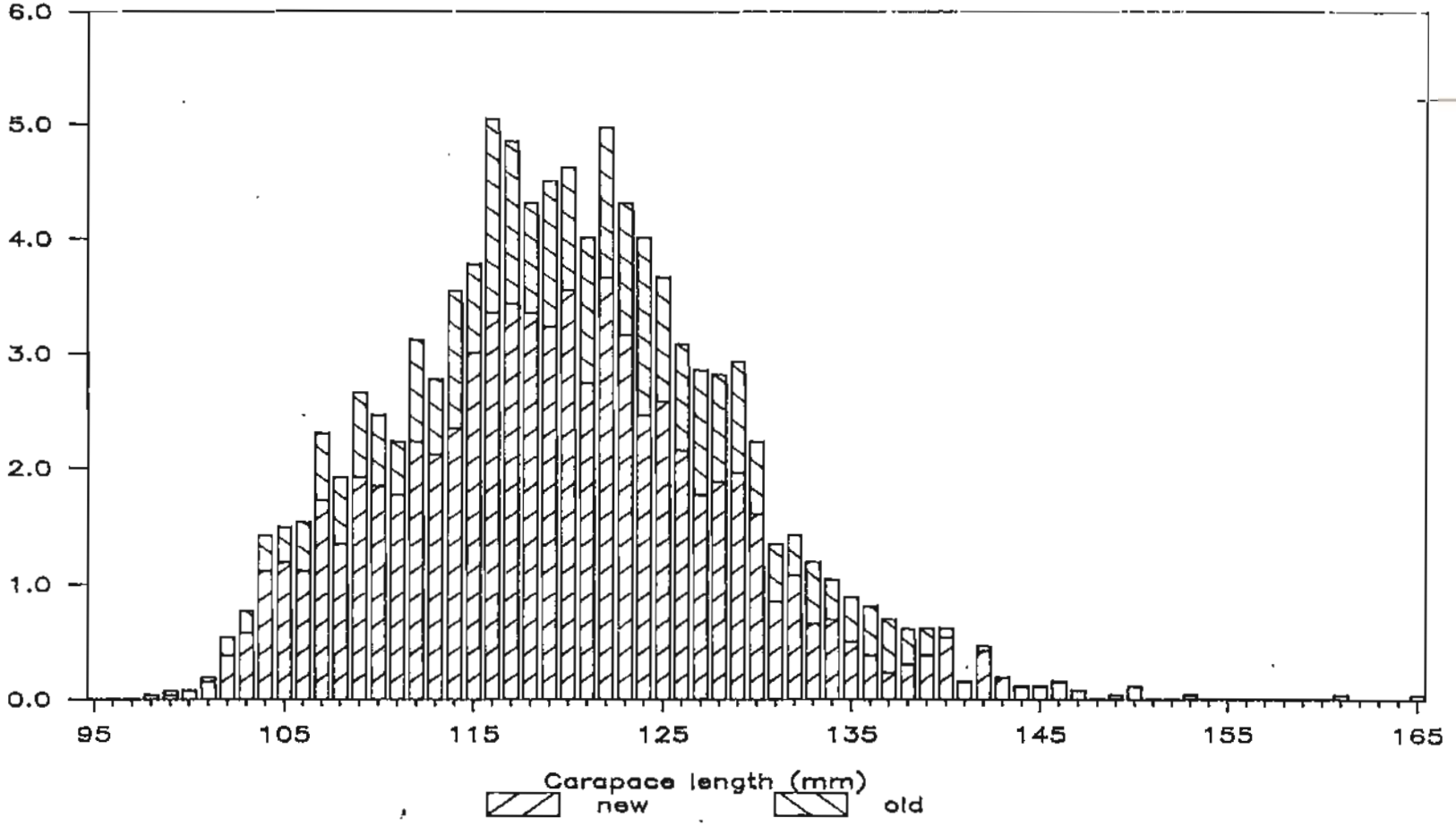


Figure 3. Length frequency distribution and frequency of new and old carapace age condition of legal male red king crab, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

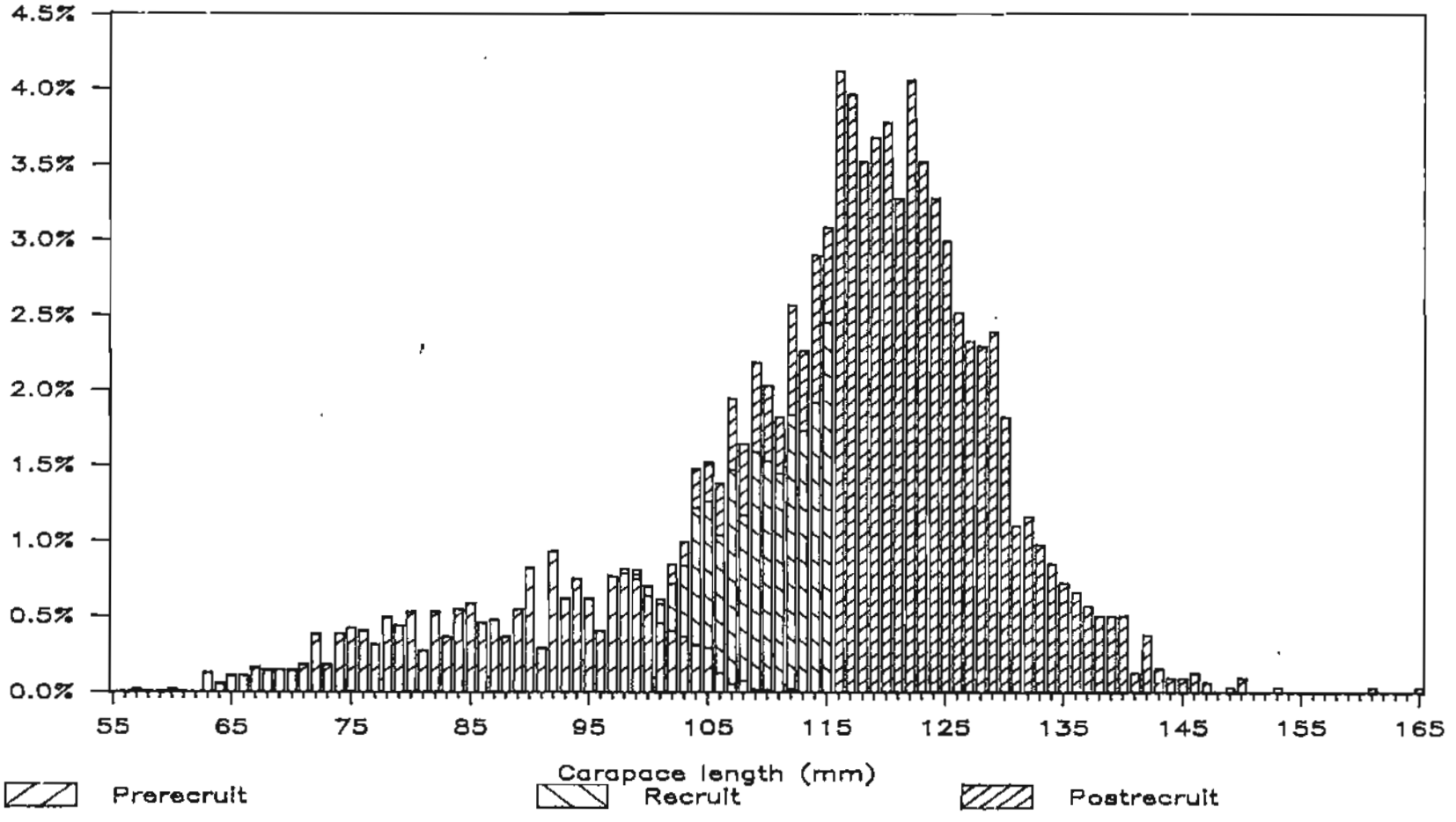


Figure 4. Length frequency distribution of prerecruit, recruit, and postrecruit male red king crab, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

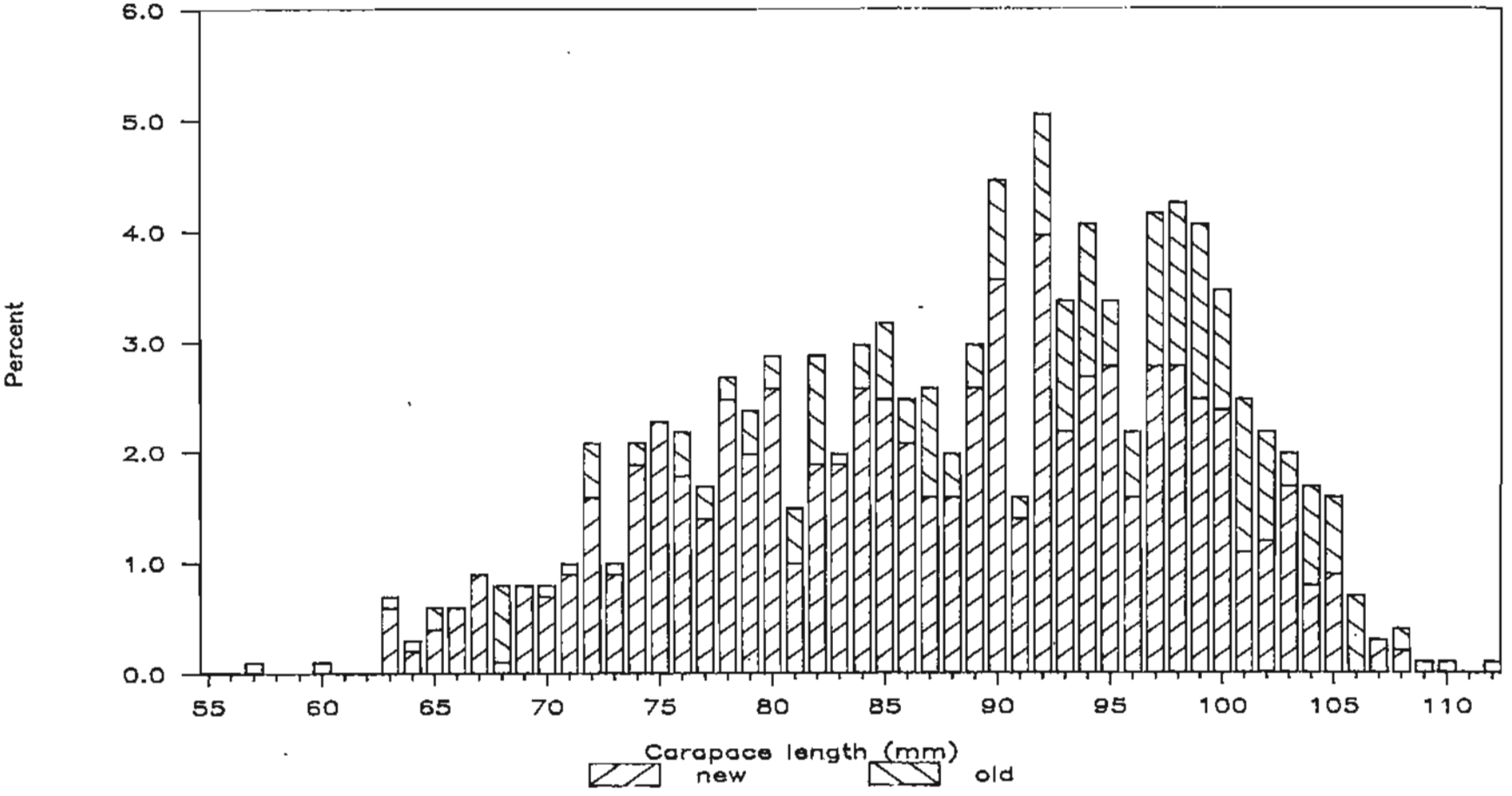


Figure 5. Length frequency distribution and frequency of new and old carapace age condition of prerecruit male king crab, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.

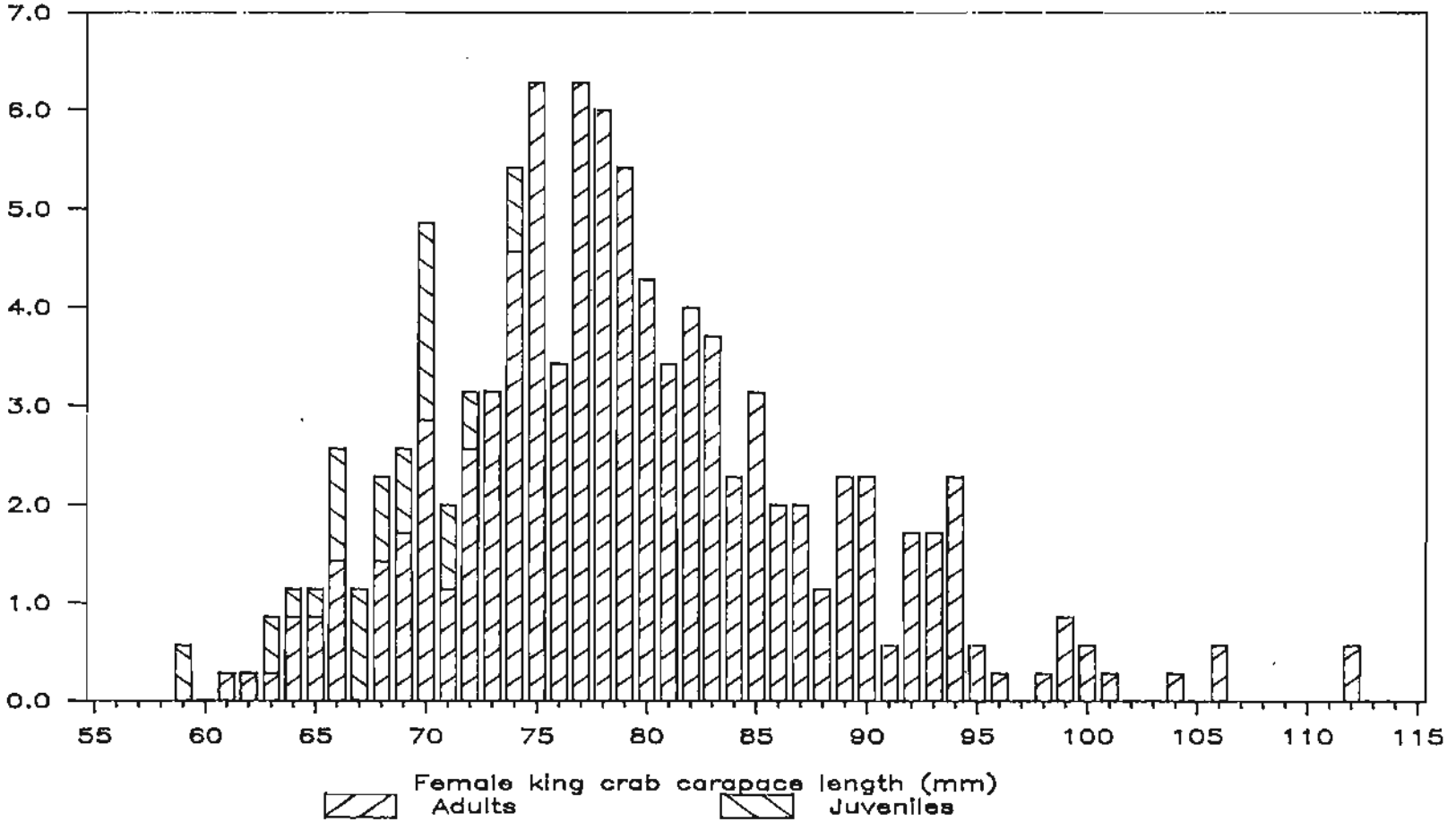


Figure 6. Length frequency distribution of female red king crab, juveniles and adults, Norton Sound Section, Eastern Bering Sea, August 1 - 4, 1989.